SmartOTDR 100 Mainframe

Handheld OTDR, designed for the construction, turn-up and maintenance of fiber networks

User Manual

JDSU

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◇ JDSU

Instructions for returning waste equipment to JDSU can be found in the Environmental section of JDSU's web site at www.jdsu.com. If you have questions concerning disposal of your equipment, contact JDSU's WEEE Program Management team at WEEE.EMEA@jdsu.com.

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About This Guide

The SmartOTDR of JDSU provides a handheld OTDR designed for the construction, turn-up and maintenance of fiber networks.

The topics discussed in this chapter are as follows:

Purpose and scope

The purpose of this guide is to help you successfully use the SmartOTDR features and capabilities. This guide includes task-based instructions that describe how to install, configure, use, and troubleshoot the Smart-OTDR.

Additionally, this guide provides a complete description of JDSU's warranty, services, and repair information, including terms and conditions of the licensing agreement.

Assumptions

This guide is intended for novice, intermediate, and experienced users who want to use the SmartOTDR effectively and efficiently. We are assuming that you have basic computer and mouse/track ball experience and are familiar with basic telecommunication concepts and terminology.

Technical assistance

If you need assistance or have questions related to the use of this product, call or e-mail JDSU's Technical Assistance Center for customer support.

Table 1 Technical assistance centers

Region	Phone Number	
Americas Telecom Products	866 228 3762 World Wide: 301 353 1550	tac@jdsu.com
Europe, Africa, and Mid-East	+49 (0) 7121 86 1345 (Europe)	hotline.europe@jdsu.com
	+33 (0) 1 30 81 50 60 (JDSU France)	support.france@jdsu.com
Asia and the Pacific Southeast Asia, Australia, and New Zealand	+852 2892 0990 (Hong Kong)	
	+86 10 6833 7477 (Beijing-China)	
All others	866 228 3762	tac@jdsu.com

During off-hours, you can request assistance by doing one of the following:

– leave a voice mail message at the Technical Assistance number in your region

– e-mail North American Technical Assistance Center, tac@jdsu.com, or European Technical Assistance Center, support.uk@jdsu.com

– submit your question using our online Technical Assistance Request form at www.jdsu.com.

Conventions

This guide uses naming conventions and symbols, as described in the following tables.

Table 2   Typographical conventions

Description	Example
User interface actions appear in this **typeface**.	On the Status bar, click **Start**.
Buttons or switches that you press on a unit appear in this **TYPEFACE**.	Press the **ON** switch.
Code and output messages appear in this typeface.	All results okay
Text you must type exactly as shown appears in this **type-face**.	Type: **a:\set.exe** in the dia-log box
Variables appear in this *type-face*.	Type the new *hostname*
Book references appear in this *typeface*.	Refer to *Newton's Telecom Dictionary*
A vertical bar | means "or": only one option can appear in a single command.	platform [a|b|e]
Square brackets [ ] indicate an optional argument.	login [platform name]
Slanted brackets < > group required arguments.	<password>

Table 3   Keyboard and menu conventions

Description	Example
A plus sign + indicates simultaneous keystrokes.	Press **Ctrl+s**
A comma indicates consecutive key strokes.	Press **Alt+f,s**
A slanted bracket indicates choosing a submenu from menu.	On the menu bar, click **Start > Program Files**.

Table 4   Symbol conventions
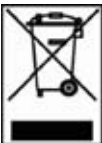
	This symbol represents a general hazard.
	This symbol represents a risk of electrical shock.
	NOTE This symbol represents a Note indicating related information or tip.
	This symbol, located on the equipment or its packaging indicates that the equipment must not be disposed of in a landfill site or as municipal waste, and should be disposed of according to your national regulations.

Table 5   Safety definitions

	WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Safety information

1

This chapter gives the main information on the safety conditions when using the SmartOTDR:

Battery and AC/DC safety information

– The Li-Polymer battery is designed for maximum safety.

In particular, each cell is provided with a safety valve to prevent excessive internal pressure in the event of overcharging or exposure to very high temperatures.

– Battery supplied by JDSU incorporate protection means.

Do not use any mains adaptor or battery other than those supplied with the instrument, or supplied by JDSU as an option for this instrument.

If another adapter or battery is used, it may damage the SmartOTDR itself.
Using the SmartOTDR with a battery other than the one supplied by the manufacturer of the SmartOTDR may entail risks of fire or explosion.

The battery may explode, leak or catch fire:

– if it is exposed to high temperature or fire
– if it is opened or dismantled.

Other basic safety precautions are as follows:

– Do not use AC/Adapter/Charger outdoors or in wet or damp locations
– Connect the AC/Adapter/Charger to the correct mains voltage, as indicated on the ratings label.
– Do not allow anything to rest on the power cord, and do not locate the product where people can walk on the power cord.
– Avoid using this product during an electrical storm. There may be a remote risk of electric chock from lightning.
– Do not use this product in the vicinity of a gas leak or in any explosive environment.
– Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous, high voltage points and other hazards. Contact qualified service personnel for all service.

Precautions relating to optical connections

– The normal operating life of an optical connector is usually of the order of a few hundred manipulations. It is then advisable to manipulate the optical connections of the Platform as rarely as possible.
– The proper operation of the instrument and its accuracy of measure-

ment are dependent on the cleanliness of the environment and the optical connectors as well as the care taken in its manipulation.

– The optical connectors must therefore be clean and dust-free. If the optical connection is not being used, protect the connections of SmartOTDR using the protective caps.

Laser Safety instructions

The provisions contained in two standards define the safety procedures to be observed both by users and by manufacturers when utilizing laser products:

– EN 60825-1: 2001 - Safety of laser products – Part 1: Classification of products, requirements and user guidelines.
– FDA 21 CFR § 1040.10 - Performance standards for light-emitting products - Laser products.

Due to the range of possible wavelengths, power values and injection characteristics of a laser beam, the risks inherent in its usage vary. The laser classes form groups representing different safety thresholds.

Laser classes Standards EN 60825-1, Edition 1.2, 2001-08 and FDA21CFR§1040.10:

– VFL option: Class 2.

Warning labels for the laser classes Due to the reduced dimensions of the optical modules, it is not possible to attach the required warning labels to them. In line with the provisions of Article 5.1 of the EN 60825-1 standard, the laser class identification labels are shown below:

Reference standard	EN 60825-1, Edition 1.2, 2001-08	FDA21CFR§1040.10
Class 1	**CLASS 1 LASER PRODUCT**	
Class 2	**LASER RADIATION DO NOT STARE INTO BEAM CLASS 2 LASER PRODUCT**	**CAUTION LASER RADIATION - DO NOT STARE INTO BEAM CLASS II LASER PRODUCT**

The user must take the necessary precautions concerning the optical output of the instrument and follow the manufacturer's instructions.

Measurements on optical fibers are difficult to execute and the precision of the results obtained depends largely on the precautions taken by the user.

Introducing the SmartOTDR mainframe

2

This chapter provides a general description of the SmartOTDR.

Topics discussed in this chapter include the following:

Unpacking the instrument

1 Remove the SmartOTDR and its accessories from the packing case.

2 Check that the correct model and accessories ordered are all there.

If any part is missing or damaged please contact your local JDSU agent.

The SmartOTDR is delivered as standard with:

Table 6 Elements delivered on standard with the SmartOTDR

A Getting Started Manual
A Li-Polymer battery, set into the equipment and which must be charged before use
A mains adapter used for mains operation of the instrument and battery charging
5 country adaptable plugs (Europe / UK / US / Australia / Japan)
A hands-free soft case for the SmartOTDR
A USB cable, to directly connect the SmartOTDR to a PC

Main features

The SmartOTDR is equipped with the following elements:

– A 5 inch color capacitive touchscreen, high visibility
– Two USB 2.0 host connectors for Microscope, USB memory stick, mouse, keyboard...
– One mini USB 2.0 device connector to connect the SmartOTDR to a PC
– A connection socket for the mains adapter providing the 15 V power supply and used to charge the battery.
– LED indicators for Charge, On status and Test
– A Li-Polymer battery
– Built-in VFL (option)

With the SmartOTDR, the user can:

– Open and/or transfer files to a PC via a USB memory stick, USB cable or Wireless connectivity
– Generate pdf reports

– Open all user documentations included into the SmartOTDR
– Update the SmartOTDR firmware
– Remote the screen of the SmartOTDR onto a PC and issue commands from the keyboard of the PC
– ...

Fig. 1   SmartOTDR
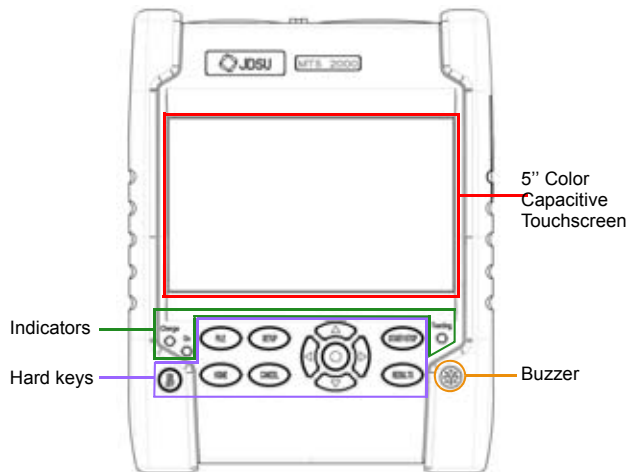
Fig. 2   SmartOTDR: Front view

VFL   USB host +   OTDR port +   Mini USB   AC/DC
       Power Meter   Power Meter (see OTDR   device   Input
       (see Chapter 5)   application User Manual)
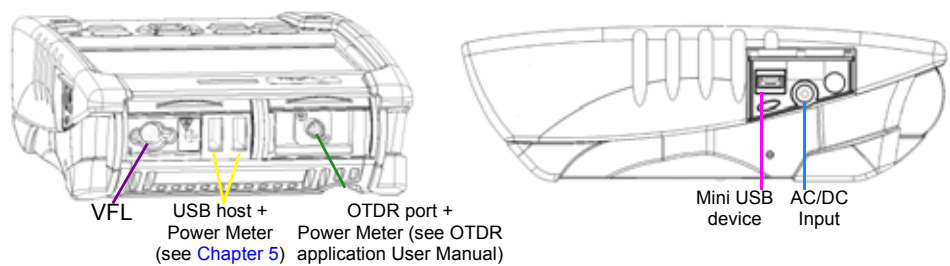
Fig. 3   SmartOTDR: Connectors View

Hard keys and Indicators

**Front panel
hard keys**
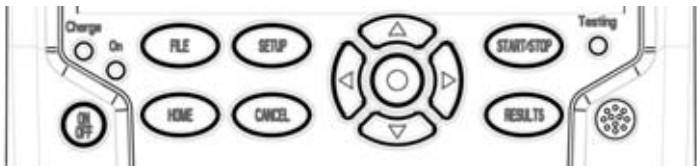
Fig. 4   Hard keys and Indicators

Table 7   Hard keys description

Hard key	Function
	Main on/off switch
	This button calls up the file explorer. It allows to: – choose the storage medium: internal memory, USB memory key. – manage files; with facilities for classifying them in directories and sub-directories.
	Gives access to: – selection of the different measurement or functions – the settings of the instrument – the help page

Table 7 Hard keys description

Hard key	Function
SETUP	This button calls up the measurement configuration menu. This menu depends on the function in use.
CANCEL	This button allows to deselect a function or escape a menu
START/STOP	Starts and stops the measurement.
RESULTS	This button calls up the results page (e.g. with OTDR module: reflectometry trace and table of results).

The direction keys have two principal functions:

– on the Results page, they are used to move the cursors or modify the zoom factor.
– on the set-up pages, they are used to scroll through the menus, the central button serving to select or confirm the parameter chosen.

Front panel indicators The SmartOTDR is equipped with three indicators, lit into a different color according to the status of the unit.

Table 8 Indicators Status

On indicator		
On *Blinking green*	The instrument, though connected to an external power source, is switched off.	
On *Solid green*	The instrument is operating, either by battery or on an external power supply.	
Charge indicator		
Charge *Solid green*	The instrument is connected to an external power source and the battery is fully charged.	

Table 8   Indicators Status

Charge *Solid red*	The instrument is connected to an external power source, and the battery is on charge.
Testing indicator	
Testing *Solid red*	At least one function is in measurement phase (for example, the laser emission pilot for an OTDR measurement)

Power Supply

The SmartOTDR may operate with

– the Li-Polymer battery.
– an AC adapter/charger, via a power cable on which has been set the correct country adaptable plug.

Power supply plug

Interchangeable plugs

UK adaptable plug (installed by default)   EUROPE adaptable plug   US adaptable plug   JAPAN adaptable plug   AUSTRALIA adaptable plug   INDIA adaptable plug
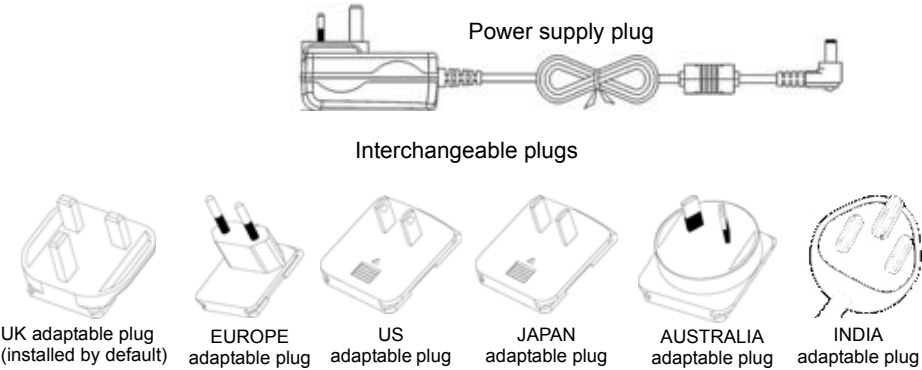
Fig. 5   Delivered elements for SmartOTDR supplying

Starting up

3

This chapter describes the first steps to perform when using the Smart-OTDR.

The topics discussed in this chapter are as follows:

Setting the adaptable plug to the mains adapter

The SmartOTDR is supplied as standard with a mains adapter and 5 country adaptable plugs (Europe / UK / US / Australia/Japan).

To set the correct plug to the mains adapter:

1 Make flush the connector onto the mains adapter with the adaptable plug slots.

2 Push the adaptable plug until it stops.
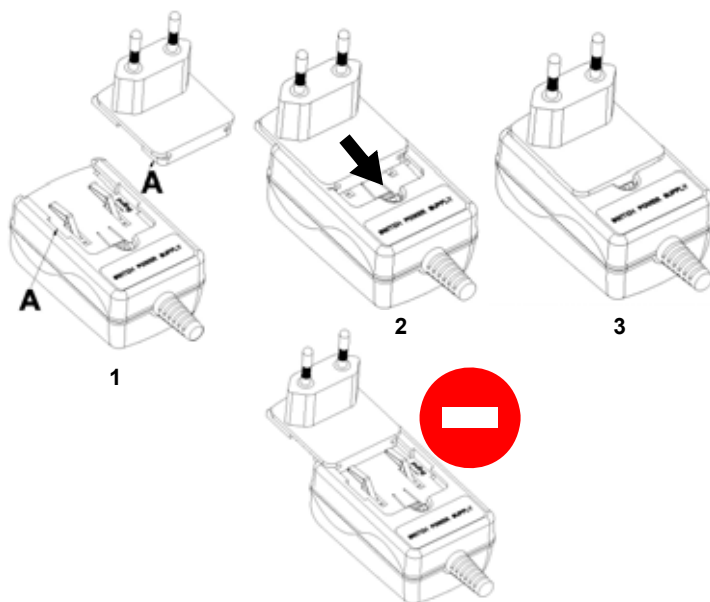
Fig. 6 Setting the adaptable plug onto the mains adapter

> **If the adapter plug is not correctly set onto the mains adapter, the connector may be damaged.**

Charging the battery

Connecting the mains adapter

1 Set the appropriate adaptable plug to the power supply cable, according to your country (see page 12).

2 At the right side of the SmartOTDR, lift up the power supply socket protector and plug in the mains adapter.

3 Connect the adapter to the mains.

The **On** indicator lamp starts to blink in green.

> ⚠ **Use only the mains adapter supplied with the SmartOTDR. The adapter for some other electronic device may appear to be identical, but entails a risk of damage to the SmartOTDR.**

First use of the battery

At the delivery, the battery is already set into the equipment, but its charge level is not «recognized» by the equipment.

The icon 🔍 is displayed on the upper banner of the screen.

To get a valid indication of the battery, and be able to use correctly the Platform:

1 Charge fully the battery

2 Once fully charged, discharge the battery by keeping the Platform switched on, but not plugged to mains.

3 The battery can then be charged, and the Platform used simultaneously.

Charging the battery

On connection to the mains:

– if the user does not press **ON**, the battery will start the charge. In this case, the **Charge** indicator will be lit in red.

– when the user presses the **ON** key, the instrument starts up and the battery will charge during use (**Charge** indicator in solid red).

Once the battery is fully charged, the **Charge** indicator is lit in solid green.

When the **Charge** indicator is blinking red, this mean the power supply is not compatible with the battery used. Charge is disabled.

> ⚠ **It is essential to wait until charging is complete to ensure maximum independent operating time, which may otherwise be considerably reduced.**

Battery charging time If the battery is completely discharged, the time taken to recharge is:

– approximately 5 hours, if the apparatus is not in use (**Charge** indicator solid red)

– about 10.5 hours if the instrument is used during charging (**On** indicator lit in fix green, **Charge** indicator lit in solid red).

Battery charge level display When the battery is installed in the instrument, a battery icon is displayed in the top right-hand corner of the screen. Example: .

Table 9 Battery icons

	The battery capacity is superior to 75%
	The battery capacity is set between 50% and 75%
	The battery capacity is set between 25% and 50%
	The battery capacity is inferior to 25%
	The battery capacity is unknown. Perform a full charge/ discharge of the battery to get back to a valid indication. This icon may appear if battery is changed or if the battery auto discharges at a very low level (example: if a Platform switches off as battery is empty, and the charge is not done during several months (= auto discharge)).

– When the level becomes too low, the instrument emits a beep ton inform the user until it switches off automatically after saving the current configuration and measurement.

Switching the SmartOTDR on and off

Switching on the SmartOTDR **1** Press the **ON/OFF** key.

If the equipment is powered to mains, the battery will charge.

The **On** indicator pass from blinking to solid green.

The JDSU logo appears on the screen briefly, then an auto test is carried out.

The equipment is ready to be used once all the applications are installed.

NOTE

It is possible to switch over from battery to mains operation, or vice versa, without loss of data.

⚠️ **In the event of an unexpected mains power cut, if there is no battery, the current results and configuration will not be saved. Next time the instrument is switched on, it will return to its initial configuration.**

Switching off the SmartOTDR

While the SmartOTDR is operating, press the **ON/OFF** button to switch it off.

NOTE

When the instrument is switched off using the **ON/OFF** button, current results and configuration are saved. Next time the **ON/OFF** key is pressed, they are recalled.

Resetting the SmartOTDR

If the SmartOTDR freezes, prolonged pressure (about 4 s.) on the **ON/OFF** key will reset the instrument.

Choosing the position of the instrument on the work surface

Depending on the conditions of use of the Platform 8000, the instrument may be placed on a flat surface or held in the hand.

When used on a work surface, the SmartOTDR should be supported on its stay, which can be set in either of two positions, depending on whether the user is standing or sitting.

To change the stay from "seated user" position to "standing user" position, pull the stand outside of its housing until the stop.

Push the stand to return to «seated user» position.

Stand

Pull to lift
the stand

Fig. 7   SmartOTDR «seated» and «standing» user
positions

First start: configuring your regional settings

Once the SmartOTDR is switched on, the first screen displayed allows to
configure the regional settings.

Those settings will be kept in memory and automatically applied on the
instrument each time it is restarted.

Fig. 8   Regional Settings

1   Click on **Language** and select the language to be used for the
equipment.

2 Click on **Date** and enter the current date, using the numeric keypad displayed using the menu key **Edit Number**.

3 Click on **Time** and enter the current time, using the numeric keypad displayed using the menu key **Edit Number**.

The date and time are displayed on the upper right side of the screen.

4 Click on **Date Time Format** and configure the following parameters:

– **Date format**: select one of the option **dd/mm/yy** or **mm/dd/yy**.

– **Time format**: select one of the option **24 hour clock** or **12 hour clock.**

5 Once all parameters have been defined, press **Exit** menu key to return to **System Settings** page.

Configuring the SmartOTDR

4

This chapter describes the operations for configuring the instrument.

The topics discussed in this chapter are as follows:

Displaying the System Settings screen

To display the **System Settings** screen, you must:

1   Press the **HOME** hard key to reach the **Home** page.

Fig. 9   Home page

2   Activate the **Settings** icon [icon] to open the **System Settings** screen.
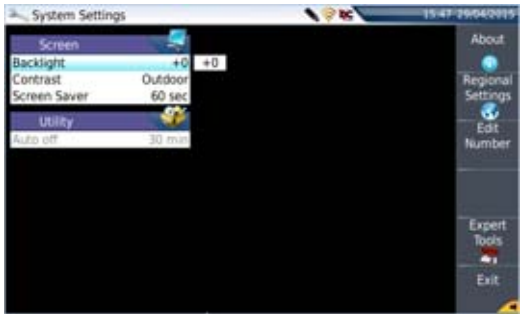
Fig. 10   System Settings page

━━━ | **NOTE**

If you are in the Regional Settings page, and you press **Exit**, then the **System Settings** page automatically displays.

Defining the screen parameters of the SmartOTDR

In the **System Settings** page, the following parameters can be defined:

Backlight 1 Click on **Backlight**

2 Define the backlight level of the screen, using the left and right direction keys, or clicking on **Edit Number** softkey and using the keypad displayed.

– <u>Min backlight level</u>: -5
– <u>Max backlight level</u>: +5

⚠️ **If the SmartOTDR is operating on battery or , it is advisable to choose a minimum lighting level, acceptable for the user, to keep endurance as long as possible.**

Contrast 1 Click on **Contrast**

2 Select the type of environment into which the instrument is used:

– **Indoor**: to be selected when the instrument is used inside (see Figure 10 on page 20)
– **Outdoor**: to be selected in order to optimize the readability of the screen for an outside use.

Fig. 11 Example of indoor contrast

Screen Saver Click on **Screen Saver** if you wish to activate a screen saver to the equipment, to extend the life of the battery, in case the SmartOTDR is not used for some time.

Instead of the normal screen, a small animated picture of the Smart-OTDR is displayed on the blackened screen.

To configure the screen saver:

1 Click on **Delay** and select the time of inactivity before the screen saver starts: **60s**, **3 min**, **5 min**.

The parameter **No** deactivates the screen saver function.

Defining the Automatic shutdown of the SmartOTDR

The automatic shutdown function switches off the SmartOTDR automatically if no operation has been performed and no key actuated for a period selected from this menu. Work in progress is automatically saved.

> **The function for automatically switching off the SmartOTDR is available only on battery operation, to save the battery.**

1 In the **Utility** box, click on **Auto off** parameter.

2 Choose a time after which the SmartOTDR will be switched off automatically, if no action has been done for that period: **5**, **10** or **30 minutes**.

Select **No** if the SmartOTDR must not be switched off, even if there is inactivity on the equipment.

Power meter & VFL (Visual Fault Locator)

5

A variety of built-in optical options are available when ordering. See references in Chapter 10 "Options and accessories", for details.

The topics discussed in this chapter are as follows:

Connection to the power meter and VFL

Power meter optical connection via OTDR port (see OTDR User Manual)

VFL   Power meter optical connection via USB (see below)

Fig. 12   Optical connectors

The type of optical connector used for the power meter is UPP (Universal Push Pull), which is compatible with all diameter 2.5 mm connectors (FC, SC, ST, DIN, E2000, etc.)

Accuracy of measurements

A high degree of accuracy is often required. It is then necessary to perform a preliminary calibration without the fiber under test to eliminate the losses due to connections as far as this is possible. To do this, use the «Reference Value» function.

Using the Power meter via USB port

The power meter function is an option chosen at the time of order and incorporated into the SmartOTDR in the factory.

To activate the function:

1   Press the **HOME** button

2   Activate the power meter icon of the Mainframe ![Singlemode Powermeter].

The effect of this action will to be to bring the power meter into use and to display the Results page for Power Meter.

Configuring the parameters of the power meter

The powermeter parameters can be accessed with the **SETUP** key.
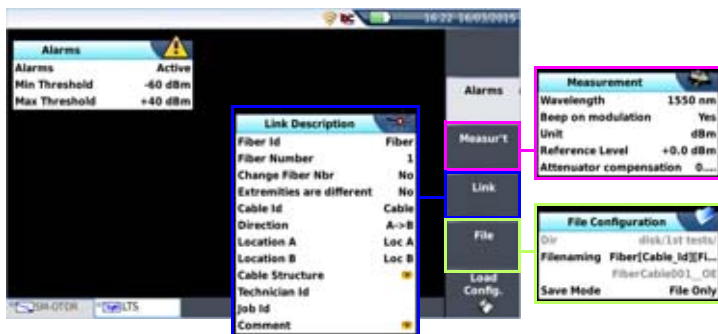
Fig. 13   Configuration of power measurement

Configuring the alarm parameters   **Alarm**   Activation of the Alarm function: any result below the lower threshold or above the upper threshold will be displayed in red on the Results page.

Min and max thresholds

Choice of lower and upper thresholds for each available wavelength, from -60 to +40 dBm (selected with the direction keys).

NOTE

To copy one value of the Lower or/and Upper threshold for all wavelengths, select the reference value and click on **Update for All Wavel.**.

NOTE

A continuous push on direction keys increments the value by 10 dBm.

Configuring the Measurement parameters   In the **Setup** page, press **Measur't** soft key (if one parameter is selected in the current screen, press **Top Menu** soft key to display the right menu keys and click on **Measur't**)

Wavelength   Select wavelength:
Auto: the wavelength of the input signal will be automatically detected and selected to perform the measurement:
1310, 1490, 1550, 1625 or 1650 nm: measurement performed at specified wavelength.

> **NOTE**
>
> Using MP 60 or MP80 power meter, set manually to **Auto** the Lambda to automatically detect the wavelength: in results page, press **Power Config.** > **Wavelength** key multiple times until **Auto** is displayed.

Beep on modulation

Select if a sound must be heard when a modulation occurs (**Yes** / **No**)

Unit Unit of power displayed:

Watt, **dBm** for displaying absolute power

dB for displaying a result relative to a reference (link loss)

Reference level

If dB units were chosen in the previous line, selection of the reference value for the wavelength selected. Using the direction keys, first choose the wavelength, then press the > key to access choice of the value (+XXX.XX), then confirm this value with the **ENTER** key. This reference is also automatically available, in the **Results** page, using the **Set as Reference** key.

Attenuator compensation

Choice of level to be applied to the wavelength chosen for measurement to compensate for the loss due to the external attenuator (+XX.XX dB). First use the direction keys to choose the wavelength, then press ▶ to access choice of value, then confirm this value pressing **ENTER.**

> **NOTE**
>
> To copy a Reference Level/Attenuator Compensator on all wave-lengths, select the reference wavelength and click on **Update for All Wavel.**.

Configuring the In the **Setup** page, press **Link** soft key (if one parameter is selected in
Link parameters the current screen, press **Top Menu** soft key to display the right menu keys and click on **Link**).

> **NOTE**
>
> The softkey **Copy File/Link To all** is displayed when one parameter is selected in the Link or File Setup page and when the Powermeter or Source function is active.
>
> It allows to apply the Link and File configuration parameters of the current applications to all the other active Fiber Optic applications (powermeter and source).

The information entered in the **Link Description** window concerns the editing and/or the modifications of the cable and fiber parameters. When a trace is recalled without recall of the configuration, the parameters of this trace will be present only in its signature.

Fiber ID

Select the parameter **Fiber Id** and enter a name for the fiber, using the edition keypad.

Fiber Number / Fiber Code

The parameter **Fiber Number** becomes **Fiber Code** if, in the **Cable Structure** window, the **Cable Content** parameter is defined on another parameter than **Fiber** (**Ribbon/Fiber**, **Tube/Fiber** or **Tube/Ribbon/ Fiber**). See page 30.

The fiber code corresponds to the fiber number if, in the **Cable Structure**, the parameter **Color coding** is defined on **No**.

The fiber code corresponds to the fiber color if, in the **Cable Structure,** the parameter **Color coding** is defined on **Yes**.

Select the parameter **Fiber Number/Fiber Code** and modify the parameter using the left and right direction keys.

The fiber number can be automatically incremented/decremented at each new file save if it has been configured in the File Setup page (see "Change Fiber Nbr" page 28).

NOTE

The Fiber Code and the fiber number concatenated with **Fiber Name** are interdependent: they are incremented or decremented at the same time. However, the fiber number remains a number only, while the fiber code is alphanumerical. Whether it includes a color code or not (see "Cable structure" page 29), it may be composed of one, two or three parts (see figure Table 14 on page 28).

Fiber and cable parameters used in the example: Fiber Name: 'Fiberx' Cable Content: 'Tube/Fiber' Max Tube: 12 Max Fiber: 24 Coding used for the fiber and the tube: TIA				
	Fiber N		**Fiber N+1**	
Color Code	**Yes**	**No**	**Yes**	**No**
<Fiber Name>	Fiberx24	Fiberx24	Fiberx25	Fiberx25
<Fiber Code>	Bl/Aq-	1/24	Gold/Bl	2/1

Fig. 14 Example of incrementation of fiber code

Change Fiber Nbr

Increment the fiber number is automatically incremented at each new file-save.

Decrement the fiber number is automatically decremented at each new file-save

User defined Use **Edit Number** softkey to enter the increment/decrement value for fiber number.

Note: to decrement the number, enter the sign «-» before the number. Example: -1.

Min: -999 / Max: 999 / Auto: 0

No the Fiber number must not automatically modified.

Extremities are different

In some cases, it is interesting to save different information for the origin and the extremity of the cable.

If this option is validated, it is possible, after selecting the extremity to be edited in the **Cable Structure** menu, to modify the values specific to the cable (cable name, color coding, content of the coding), for each of these extremities. See chapter "Cable structure" page 29)

To display/modify the data specific to the fiber (name and code), it is necessary to change direction temporarily. In the "O->E" direction, the information on the origin can be edited, and in the "E->O" direction, that on the extremity.

Cable Id

This parameter allows to enter an identification of the cable, using the Edition menu.

Direction

The direction shows if the acquisition has been made from the origin to the extremity (A->B) or from the extremity to the origin (B->A). Changing direction makes it possible, when different extremities are handled, to see the parameters of the fiber for the other extremity.

Location A

The name of the Location A of the link may be entered here.

Location B

The name of the Location B of the link may be entered here.

Cable structure

This line opens a sub-menu, all the parameters of which can be different for each extremity.

Fig. 15   Cable structure menu

> **NOTE**
>
> The **Cable Structure** window is specific to an extremity. Each structure keeps its own parameters by default. Modifications made to the one are not automatically applied to the other. Thus, after the values relating to the origin have been modified, it is normal not to find these same values entered for the extremity.

View extremity	If extremities are declared as different (see "Extremities are different" page 28), this parameter allows to navigate between the Extremity and Origin parameters.
Cable Id	If the extremities are different, you can specify the cable identification for the origin and the extremity.
Color Coding	Choice of whether or not to apply a color coding to the fiber. This choice is made at link level, as all the fibers of a given link, for a given extremity, will be coded the same way. This choice modifies the result of the <Fiber Code> line. See "Fiber Number / Fiber

<table>
<tr><td></td><td></td><td>Code" page 27.</td></tr>
</table>

Cable content   Shows how the color code is to be used (see figure "Cable structure menu" page 29):

– Fiber   Only the color code of the fiber is proposed (example: «Gold»)

– Ribbon/Fiber   The color code of the fiber is preceded by that of the ribbon, and separated by a '/' (example: 'Bl/Or')

– Tube/Fiber   The color code of the fiber is preceded by that of the tube, and separated by a '/' (example: 'Br/Or')

– Tube/Ribbon/Fiber

                The color code of the fiber is preceded by that of the tube, then by that of the ribbon; the three being separated by a '/' (example: 'Br/Bl/Or'). See "Fiber Number / Fiber Code" page 27.

Max tube   Shows the maximum number of tubes in the cable for the extremity selected. This information influences the automatic coding of the fiber. See "Fiber Number / Fiber Code" page 27.

Max ribbon   Shows the maximum number of ribbons in the cable for the extremity selected. This information influences the automatic coding of the fiber. See "Fiber Number / Fiber Code" page 27.

Max fiber   Shows the maximum number of fibers in the cable for the extremity selected. This information influences the automatic coding of the fiber. See "Fiber Number / Fiber Code" page 27.

NOTE

Some parameters are not valid in the configuration selected. Thus, if no tube is selected in **Cable Content**, all the lines relating to the tube concept will be deactivated (grayed out in the menu).

Tube Coding, Ribbon Coding, Fiber Coding

        The lines Tube Coding, Ribbon Coding and Fiber Coding enable selection of the color coding of the tube, the ribbon and the fiber from 5 different codes described below: TIA, USER 1, USER 2, USER 3 and USER 4.

Code Definition The Code Definition line opens a sub-menu, with which the different color codes possible on the instrument can be displayed and modified.

Five different codes can be managed by the SmartOTDR, including a standard code.
The standard code (TIA) may be displayed but it cannot be modified.

The other codes, called by default USER1, USER2, USER3 and USER4, can be entirely personalized.

–	Edited code	selects the code for display or modification.
–	Code name	to give a new name to the code selected, press the ▶ key, which calls up the edit menu.
–	View codes	displays the color codes 1 to 12, 13 to 24 or 25 to 36.
–	Code 1...23	Use the arrow ▶ to modify the codes if necessary.

Operator

Use the arrow ▶ to enter the name of the operator carrying out the measurement.

Comment

In contrast to the other data in this menu, the comment is specific to a fiber. This line is thus used to enter a new comment and not to display it. The comment appears at the top of the screen, with the other parameters of the fiber.
This comment will remain available for the next acquisition, unless it is deleted. It is also saved when a trace is saved with a comment.

Configuring the File parameters The File storage parameters must be also configured, in order to define how the results will be saved on to the SmartOTDR.

In the **Setup** page, press **File** soft key (if one parameter is selected in the current screen, press **Top Menu** soft key to display the right menu keys and click on **File**).

Dir

This parameter cannot be configured, and display the directory selected by default into which the file(s) will be saved (the last directory selected).

To modify the directory, go to the **Explorer** page and select another directory.

Filenaming

Select **Filenaming** parameter and press the right arrow key to modify the name of the file for the result trace.

In the edition keypad, enter a name manually for the file and/or use the predefined parameters available (**Cable_Id**, **Fiber_Num**...). Then, press **Enter** to validate.

Predefined parameters for naming files

Fig. 16 Filenaming - Edition keypad

or

Press **Default Filename** to apply the name by default to the file:

Fiber[Cable_Id][Fiber_Num]_[Lambda]_[Direction]

The name of the file is displayed in grey under **Filenaming** parameter

Save Mode

When a trace or more is displayed, in the parameter **Save Mode**, you can select three types of methods for storing traces:

File Only	only the trace(s) is/are stored in one/several file(s), with its extension (.sor, .msor)
File + txt	the trace(s) is/are stored in one/several file(s), with its extension and one txt file is also generated.

Display of results and commands

The results page called up by the **RESULTS** button**,** gives the information relating to the measurement in progress, results previously saved and the commands available for measurement and saving.

Result of the measurement in progress

The power measured by the power meter is displayed in large characters, in the units selected in the **SETUP** menu, together with:

– the mode of transmission of the signal measured: continuous (CW) or modulated to a frequency of 270Hz, 330Hz, 1KHz, or 2KHz.

– the wavelength of the signal measured.

– the reference level expressed in dB.

– the level of Attenuation Compensation.

Table of results For one and the same fiber, the power meter displays a table of 9 results corresponding to the different possible wavelengths. The first 4 results are displayed on the screen; to scroll through the other results, use the direction key ▼ or touchscreen. The table shows the power measured in dBm, the relative power (in dB) and the reference level in dBm (if units = dB), together with the mode.

– A measurement result is displayed in the table when the **Keep Result** soft key is pressed.
– The **Clear Table** soft key orders deletion of all the results displayed in the table.
– If the Alarm function has been activated, any result that exceeds the selected thresholds appears in red in the table. Otherwise, results are shown in the table in green.
– When the instrument is switched off, results present in the table are saved.

Fig. 17 Results and commands of the power meter

Commands of the power meter parameters When the Powermeter function is selected, the following softkeys are available on the results page:

The different configuration buttons are displayed:

Wavelength selection of the wavelength

Unit choice of the unit

Zero Adjustment of the Zero value when the power meter's optical input is closed with a plug (a validation is required).

On the results page, the following actions are available:

Standard Reference

Selects the current result as reference value to measure the attenuation of a link. This reference is displayed under the measurement result until a new reference value is chosen.

Keep Result   Saves the result on the corresponding line of the table.

Clear Table   Deletes all the results recorded in the table.

If the **Source** function is selected (either on this Platform, on the base Unit or on an OTDR module, or on another Platform), the Power meter results page is different:

– The **Wavelength**, **Unit** and **Zero** menu keys are accessible via the menu key **Power Config.**.

– The **Power Ref.** menu key allows to reach the **Standard Ref** menu key. It also allows to reach the **Jumper Ref** menu key if Power meter function is associated with Source function onto another unit (see OTDR Module User Manual).

Performing a measurement The power meter is started up as soon as the function [icon] is activated in the **HOME** page.

> Power measurement is automatically updated in consequence. The value «<-60 dB» is displayed when the laser is switched off and if the source output is looped on to the power meter input.

Power measurement

1 Connect the light source to be tested to the rear connector (see "Connection to the power meter and VFL" page 24).

2 In the **SETUP** menu, choose the units dBm, dB or Watts.

3 Press the **START/STOP** key to start the measurement**.**

The result will appear in the results page and can be memorized in the table (see "Table of results" page 33).

4 Press the **START/STOP** key to stop the measurement.

Optical link loss **Setting the zero value of the power meter**

> It is important to set the zero of the power meter before making any measurements where accuracy is required, as the noise from the germanium photodiode fluctuates over time and with variations in temperature.

1 Fix the plug over the optical input of the power meter so that no light can reach the photodiode of the power meter. If the zero adjustment is made without this plug, an error message may be displayed, as the photodiode will detect too much light.

2 In the **Results** page, press the **Powermeter Config.** > **Zero** soft key and validate.

Carrying out the reference measurement

1 Fix the adapter corresponding to the jumper to the optical connector of the power meter.

2 Connect the jumper between the input of the power meter and the output of the source.

3 Configure the same wavelength on the source and the power meter.

The power measured is displayed in the results page of the power meter.

4 Press the **Standard Ref** soft key to save the result displayed as reference value.

Measurements on the fiber under test

After defining the reference value, proceed as follows to make the measurement:

1 Fix the jumpers and connectors needed to connect the fiber to be tested between the source output and the power meter input.

2 In the set-up menu, select dB units.

3 The power displayed in the Power Meter window corresponds to the optical loss of the link tested. It can be displayed in the table (see "Table of results" page 33).

VFL Function

VFL connector The type of optical connector used for the VFL source is UPP (Universal Push Pull), which is compatible with all diameter 2.5 mm connectors (FC, SC, ST, DIN, E2000, etc.)

See Figure 12 on page 24 to visualize the VFL connector.

Visual Fault Locator function (VFL) This function is used to emit a red light signal of frequency 1 Hz or in continuous mode into a fiber to detect any defects in the dead zone of the reflectometer, or to identify it.

This function is suitable for short fibers (length < 5 km) or the first few metres of a long fiber.

> **NOTE**
>
> Identification is facilitated by the blinking of light in the fiber.

To emit a light signal into a fiber:

1 Connect the fiber to the VFL port on the connectors panel.

2 Press the **HOME** key and activate the VFL

The icons ⚠ ☀ display on the upper banner of the screen.

The signal mode of the VFL can be modified in the **System Settings** page, in **Utility** > **VFL Mode** parameter.

Storing and reloading results

File Setup Click on the button **FILE** to access the **File** setup. See the chapter «File management» in OTDR User Manual for a complete description of all parameters, options and description of the explorer.

Storing results In order to save the results of a measurement, click on **FILE** and select **Store trace**. Two files are being saved:

– The first file is used with the SmartOTDR and allows to retrieve all measurement results. It is saved with the extension «.Lts».

– The second file is a ASCII file using tabulations to separate values. It is saved with the extension «.txt» and can be opened by the SmartOTDR. It has been designed to be used with a spreadsheet program on a PC where it allows to retrieve all measurement results and format them in a nice customized table.

Loading results In order to load the results of a measurement, select a file 🔲 with the extension «.Lts» in the file explorer (see the chapter «File management» in the user manual for OTDR application), click on **Load**.
The LTS tab is displayed with the loaded results in the table.

Scope

6

The scope function is a hot-plug feature enabled directly when inserting a JDSU scope supplied as an accessory (see Chapter 10):

The topics discussed in this chapter are as follows:

Scope feature

Overview This feature enables you to verify that your optical connectors are in perfect shape and very clean condition.

The P5000i Digital Probe Microscope is a portable handheld microscope used to view and inspect both the bulkhead (female) and patch cord (male) sides of fiber connectors as well as other optical devices, such as transceivers.

The P5000i requires an FBPT inspection tip and is connected to the SmartOTDR with a USB 2.0 connector.
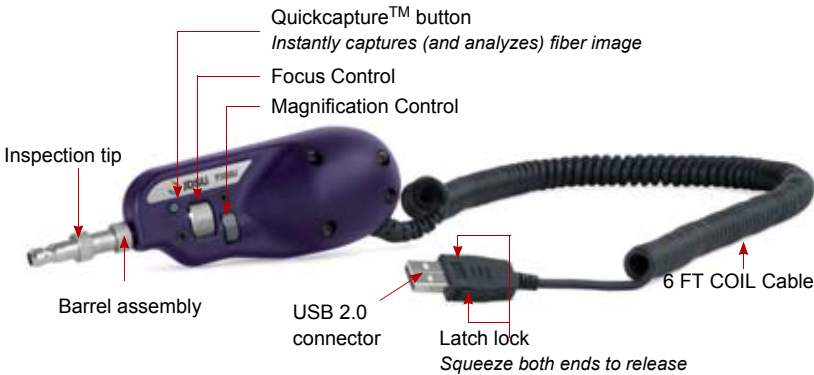
Fig. 18   P5000i Probe components

> ⚠️ **Before using the P5000/P5000i scope, make sure the Bluetooth option has not been activated, even once, after the start of the SmartOTDR. If it has been activated, stop and restart the equipment before using the P5000/P5000i Scope.**

Installation of tips

The Pass/Fail analysis function on the SmartOTDR can only be used with certain inspection tips mounted on the P5000i.

Seven tips, patchcords and bulkheads types, are delivered with the Videoscope Kit (EDFSCOPE5KI) but many others can be used.

Configuring the P5000i Scope

Scope connection

1 Plug in your JDSU scope into a USB port from the SmartOTDR.
2 Push the button Home
3 Validate the Scope function [Fiber Microscope] .
4 Connect probe with the fiber being inspected.

You may select this option while other options are already selected (e.g. OTDR).

Configuring the Scope

1 Press **SETUP** key to configure the test.

The following screen displays:
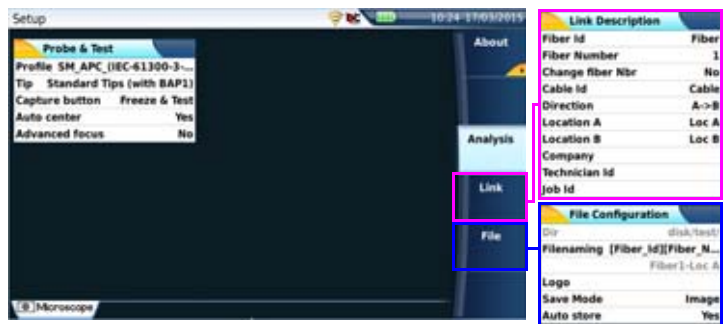
Fig. 19   P5000i Scope Setup

Analysis **Profile**

On the line **Profile**, select the Profile which will be used for the test of fiber connector:

– SM_UPC: Pass/Fail criteria for single-mode UPC connectors from IEC 61300-3-35 standard.

– SM_APC: Pass/Fail criteria for singlemode APC connectors from IEC 61300-3-35 standard.

– SM_PC: Pass/Fail criteria for singlemode PC connectors from IEC 61300-3-35 standard.

– MM_: Pass/Fail criteria for multimode connectors from IEC 61300-3-35 standard.

– Ribbon, SM_APC: Pass/Fail criteria for ribbon singlemode APC connectors

Profiles contain the analysis parameters by which PASS/FAIL criteria are determined.

Once the line is selected, you can also add a new profile, clicking on the **Add** Button (see).

Tip

On the line Tip, select the tip set onto the scope to connect fiber for inspection.

Capture button

This parameter allows to select the action of the Quick Capture button onto the Scope (see):

Freeze & Test	pressing the button will automatically perform a test of fiber and freeze the result
Freeze image	pressing the button onto the Scope will automatically freeze the live image.

Auto Center

This parameter allows to select if the scope image must be centered on screen (select **Yes**) or not (select **No**).

Advanced focus

This parameter allows to define if the advanced focus must be used (**Yes**) or not (**No**).

Link   In the **Setup** page, press **Link** softkey (if one parameter is selected in the current screen, press **Top Menu** soft key to display the right menu keys and click on **Link**).

The information entered in the Link window concerns the editing and/or the modifications of the cable and fiber parameters.

Fiber Id	Use the edition keypad, which will display by clicking on the right arrow key, to enter a specific name for the fiber.
Fiber Number	Use the numeric keypad, which will display by clicking on the right arrow key, to enter the fiber number.
Change fiber Nbr	Select if the fiber number must be modified after each results saving:
	No: the fiber number is not modified at each saving

Increment; the fiber number is automatically incremented at each results saving

Decrement: the fiber number is automatically decremented at each results saving.

Cable Id	This parameter allows to enter an identification of the cable, using the Edition menu.
Direction	The direction shows if the acquisition has been made from the origin to the extremity (A->B) or from the extremity to the origin (B->A). Changing direction makes it possible, when different extremities are handled, to see the parameters of the fiber for the other extremity.
Location A	The name of the Location A of the link may be entered.
Location B	The name of the Location B of the link may be entered.
Company	Enter the name of the company carrying out the test.
Technician Id	Enter the name of the operator carrying out the test.
Job Id	This line is used to enter a description of the job in progress.

NOTE

All parameters of the Link Description box will appear in the pdf report or jpg file generated from a test results page.

File   The File box allows to configure the saving of scope results.

Dir	The **Dir** parameter is displayed in grey, and indicates the directory into which the results will be saved. To change the directory, press **FILE** hardkey and select another directory from the file **Explorer** page; then press **SETUP** hard key to return to Scope Setup page.
Filenaming	Use the edition keypad, which will display by clicking on the right arrow key, to enter a specific name for the file. You can enter manually a name and/or use pre-defined parameters (Fiber Id, Cable Id, Locations...).

Pre-defined
parameters
for filenaming

Fig. 20   Edition keypad for filenaming

The line below **Filenaming** shows the name of the file according to the
parameters entered.

Logo	Click on right arrow key and select in the Explorer a JPG file which will represent the Logo displayed on the upper left part of the report
Save mode	Select if the test results must be saved only in an **Image**, only in a pdf **Report** or in an image + a pdf report (**Image + Report**).
Auto Store	Select **Yes** if the saving must be done automatically after a test, or **No** if the saving must not be done automatically.

Adding a new profile Once the Setup screen of the scope is displayed, you can add a specific profile which will be used for the test.

The profile must be created via FiberChek2TM, and stored on one
storage media of the SmartOTDR (disk, or USB memory stick).

1 On the Setup screen, select **Profile** and press **Add** key.

2 On the explorer, select the file which will be used as profile (icon
     ; extension: .PRO)

3 Press **Load**.

    Once loaded, the display goes back automatically to **Setup** screen.

4 Select the profile just loaded.

Removing a profile

1 In the **Profile** list, select the profile to be deleted.

2 Press **Remove** key, then **Exit**.

About page On the **Setup** screen, the softkey **About**, on the right of the screen, allows to display information on scope and current test result displayed (in Full Screen mode or mosaic mode - see "Mosaic Mode" on page 46).

1 Press **About** softkey to display a page as the following one:

Information on scope used

Information on active snapshot
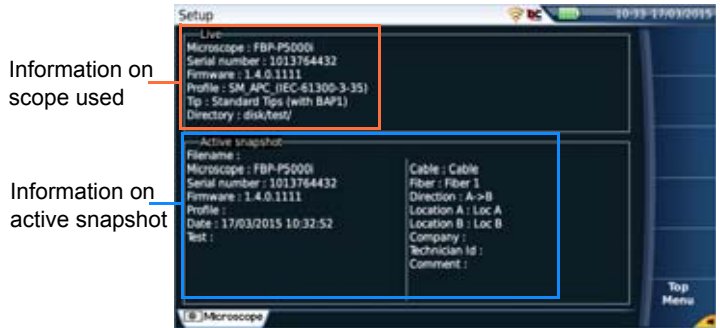
Fig. 21 P5000i Scope: About page

Starting up with the scope

Once the FiberScope icon is validated:

1 Press **RESULTS** hard key

Sharpness level

Fig. 22 Example of the result using the P5000i scope

Use the **Focus Control** button onto the P5000i scope (see Figure 18 on page 38) to adjust the image quality and sharpness.

NOTE

To switch from Scope page to FO results page and vice-versa, press the **RESULTS** hard key for about 2 seconds (a beep is emitted).

Freeze mode   Once the image is acceptable, you may freeze the picture. This feature allows to store in memory the resulting picture.

> ⚠️ **Freezing a scope result does not store the picture in a file (see "File menu" on page 48). The result will be lost if the instrument is shut off, or if more than 3 pictures are frozen (see "Mosaic Mode" on page 46)**

▬▬▬ **NOTE**
The button set on the lead, or the QuickCapture™ on the P5000i allows to freeze the picture or to take a snapshot.

High Mag. / Low   The **High Mag./Low Mag.** menu key allows to switch the display from
Mag.   High to Low magnification and vice-versa.

This function is also available pressing the button directly on the P5000i (see Figure 18 on page 38).

Live mode   If you are in Freeze mode, or in Mosaic mode, with a picture selected (see "Mosaic Mode" on page 59), press **Live** menu key to return to live camera picture.

> ⚠️ **Use the focus control to adjust the focus of the image**

Launching a test of the connector and fiber end-face

Launching a   Once the display is correctly adjusted (magnification, sharpness...), a
test of the   test of fiber connector can be launched.
connector and   To launch the test:
fiber end-face

1 Press **Test** key to launch the test of plugged fiber connector.

The test is completed:

– once the Led **Testing** is no more lit in red

– once the icon ⏳ is no more displayed on the upper banner

– once a screen as the following one displays:

▬▬▬ **NOTE**
To configure Pass/Fail criteria, see "Configuring the Scope" page 39.

Profile selected
in the Setup page

Summary of
Test results

Test result in
High mag.
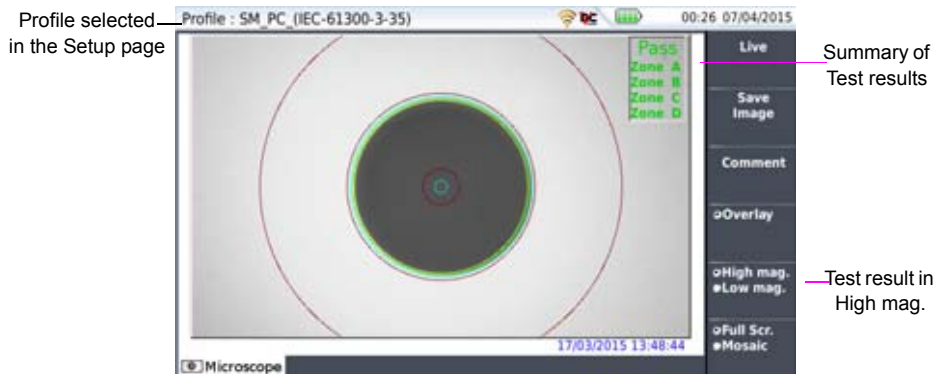
Fig. 23 Test results

A summary of test results is displayed on the right, upper part of the screen.

– Zone A: **Core** zone: it is the area surrounding the core

– Zone B: **Cladding** zone. It surrounds the majority of the fiber cladding.

– Zone C: **Epoxy** ring.

– Zone D: **Ferrule/Contact** zone: it identifies a portion of the ferrule near and around the fiber
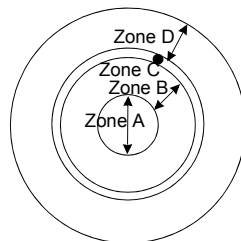
NOTE

To return to a Live Camera image, press the **Camera** key; or press the **Full Screen/Mosaic** key view both the live image and a test result simultaneously.

In **Mosaic** mode (see "Mosaic Mode" page 46), the result of the test only displays Pass or Fail information; the status of each zone is displayed only in full screen mode.

Overlay The Overlay key allows, when selected, to display the limits of each zone and to display with colors the defaults on the image.

When the key is deselected, the zones and defaults are not graphically identified.

This function is also available in Mosaic Mode (see "Mosaic Mode" on page 46).

Mosaic Mode

It is possible to display only one picture in full screen (640 * 390 pixels) or up to four pictures (320*180 pixels each, including the live camera picture) in mosaic mode. Use the key **Full scr./Mosaic** to switch from one mode to another.

Selected picture

Position 1 :
LIVE CAMERA

Position 2:
File saved on disk
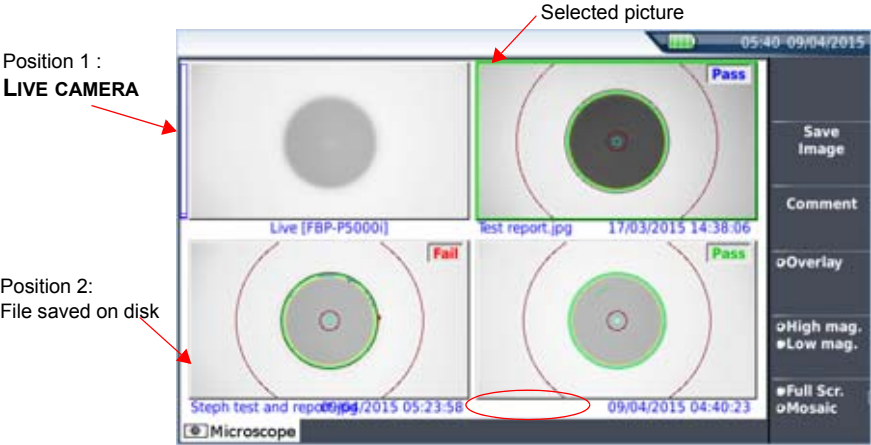
Fig. 24   Mosaic mode

– You may select one of the pictures by clicking on it.

The selected picture is framed in green.

The tool bar on the right varies according to which picture is selected (camera, or static picture):

Picture selected: Camera

Test	Allows to launch a (new) test of the connector (see "Launching a test of the connector and fiber end-face" on page 44)
Freeze	The live picture from the camera is frozen but does not replace the live picture at position 1. The new snapshot is placed at the second position, and all existing pictures are pushed to the next position.

⚠️ If all positions were taken, the picture that was once at the fourth position is unloaded from memory. Frozen pictures and snapshots are lost, unless they were saved on the internal memory.

| **High mag./Low mag.** | allows to modify the live display from high to low magnification and vice-versa |

Picture selected: Image

Save Image	allows to save the selected picture in the directory Scope, in the disk of the Platfom. Press **Save** key, enter a name for the jpg file and validate. This key is not available with jpg files other than those resulting from scope application.
Comment	allows to add a comment to the selected picture (see "Adding a comment" on page 47)
Overlay	The **Overlay** key allows, when selected to display with colors the defaults on the image.
	When the key is deselected, the zones and defaults are not graphically identified.
High mag./Low mag.	allows to switch all the images from scope test results from high to low magnification and vice-versa.

Adding a comment

The key **Comment** allows you to enter/modify a comment to your picture if necessary. This comment appears at the bottom left of the picture.

The right bottom of the frozen picture also contains the date of the acquisition (where the picture was frozen).

NOTE

Both the comment and the date will be saved with the picture.

Loading a picture

It is possible to retrieve and load a picture stored in the Scope directory and display it in the Scope page.

1 Press the **FILE** button.
2 Select the JPEG file to be loaded via the Explorer
3 Click on **Load**

Recognized pictures are images resulting from the Scope option and saved on disk via the SmartOTDR.

⚠️ **Some pictures resulting from the Scope option may appear nevertheless unrecognized, if they have been stored with a different Scope application, or if the JPG file has been opened and modified under another JPG editor.**

Even though the JPG editor of the Scope function has been designed to display Scope pictures in black & white, it is also possible to open any JPG valid file and display in color the corresponding picture. That picture is enlarged or shrunk to the size of the display (full screen or mosaic, see."Mosaic Mode" page 46).

File menu

Saving the test result in a jpg file and / or in a report

Once the test has been performed, and the result is displayed on the SmartOTDR screen:

1 Click on **Save Image** soft key to save a jpg file and / or a pdf report of the test result on the disk of the SmartOTDR.

2 On the edition keypad, enter the name of the file(s)

3 Press **Enter** to validate.

The file is automatically saved on the disk, in the directory **Scope** (icon 🔘 for jpg file, icon pdf for report).

Display of the report

Once the report has been generated:

1 Press **FILE** hard key.

2 On the right menu keys, press **Explorer** soft key.

3 In the **File Explorer**, select the pdf report just created.

4 Press **Load**.

Logo, company &
parameters selected in
the Setup page (see
"Configuring the
Scope" on page 39)
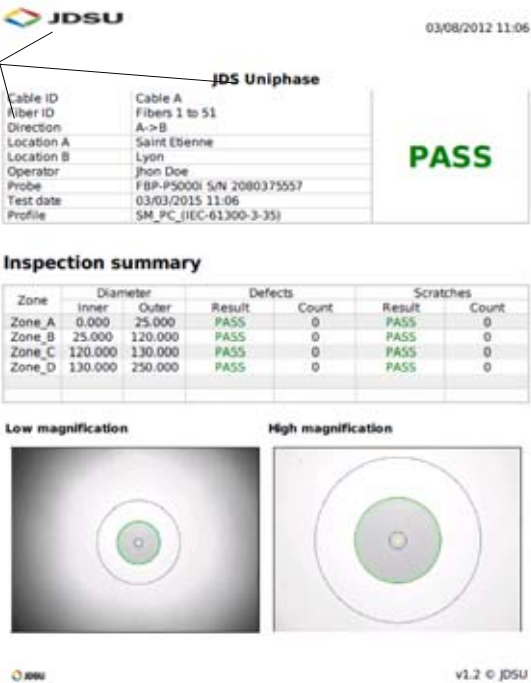
Fig. 25 PDF report of Scope test result

Connectivity

7

This chapter describes the different ways to access to the SmartOTDR interface or content using different connection modes.

Topics described in this chapter are as follows:

Establishing connection

Via Bluetooth   The Bluetooth interface allows interface and file transfers.

It is an option that must be installed at the factory.

⚠️ | **The product is approved in accordance to R&TTE directive concerning transmitter module marked by CE0678. It is manufactured by MITSUMI and it is an OEM product.**
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. This device contains FCC-ID: POOWML-C40.

Installing the Bluetooth option onto the SmartOTDR   The Bluetooth option is delivered on a USB dongle to be connected to the board which will be inserted into the SmartOTDR.

To install the Bluetooth option onto the equipment:

1   Switch off the SmartOTDR and, if necessary, unplug it from mains.

2   Remove the cover on the underside of the Platform, unscrewing the two screws.

If the board is already set into the Platform, follow instructions on step 4.

3   Insert the board, pressing it gently but firmly, taking care to the connectors.

Fig. 26   View board and connectors

4 Insert the Bluetooth into the connector of the board.

Fig. 27 Bluetooth set into the Platform

5 Screw back the cover onto the Platform

6 Restart the SmartOTDR, pressing **ON** button.

The Bluetooth option can be launched.

> **An external USB dongle is also available (reference E60EBLUE).**

Pairing the Platform with a device

1 On the **Home** page, press **Connectivity** key

2 Under **Connectivity** page, select **Bluetooth**

The following screen displays

Fig. 28 Bluetooth disabled

3 Press the menu key **Bluetooth** to enable the Bluetooth interface**.**

The icon ❄ is displayed on the upper banner of the screen

The Paired Bluetooth Devices screen appears

4 Press the **Become Pairable** soft key to wait for another device to initiate the connection to the SmartOTDR.

A screen as the following one displays:

Fig. 29 Waiting for pairing

5 Activate Bluetooth on the equipment which need to be paired with the Platform

6 If you are asked to, enter a pairing code on the equipment.

7 In this case, once the pairing code is validated on the equipment, enter the same pairing code on the Platform to validate the connection:

Fig. 30 Enter Pairing code

8 Press **Enter** to validate.

Both equipment are now paired:
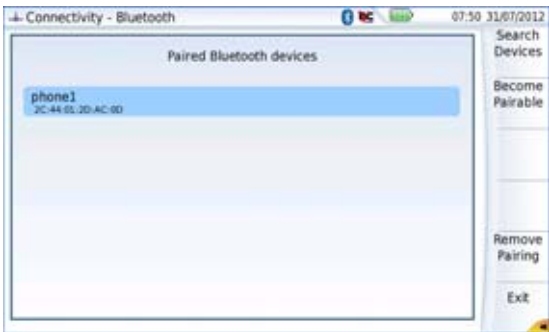
Fig. 31   Platform paired with one equipment

The icon has a blue background when paired with a device ⑧, versus no background when not paired ✳.

Searching new **1** If the desired device is not displayed on the screen, or if no devices
devices to be   are detected, press the **Search Devices** soft key.
paired with the   The SmartOTDR is searching for the devices which could be used
Platform   via Bluetooth with the equipment.

> ⚠ **REMINDER**
> **You may need to activate bluetooth on the other device to allow pairing.**
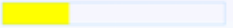
A baragraph is displayed during research

Once the research is completed, a list of the available devices is displayed, with the level of detection of the SmartOTDR

Fig. 32   List of devices found

      a   Select the device to be paired with the Platform

           It will be underlined in blue

      b   Push the **Pair** key to connect the device to the Platform

2   If prompted, enter a pairing code. The code must be identical on the SmartOTDR and the device.

3   Once the bluetooth device and the Platform are paired, a screen is displayed with the description of the device (see Figure 31 on page 55).

The icon has a blue background when paired with a device 🅑 , versus no background when not paired ✳ .

You can now go to the file explorer and transfer files from the Smart-OTDR toward the bluetooth device and vice versa (see "Transferring files via Bluetooth" on page 77) or transfer the Platform interface on VNC via Bluetooth (see "Transferring files to/from a PC via WIFI" on page 78).

Removing the Pairing

1   To remove the pairing between the two equipments

2   From the Home page, press **Connectivity > Bluetooth**.

3   Push the **Remove pairing** key

The icon on the upper banner of the screen becomes ✳ showing the Platform is no more connected to a bluetooth device, but the Bluetooth option is still active.

To deactivate the bluetooth onto the Platform, press Bluetooth menu key to disable the interface.

Via Wifi

The WIFI application is available on option with the SmartOTDR, ref E10WIFI.

Installation of the WIFI option in the Platform

The WIFI option is delivered on a USB key to be connected to the WIFI board which will be inserted into the SmartOTDR.

To install the WIFI option onto the Platform:

1   Switch off the SmartOTDR and, if necessary, unplug it from mains.

2   Remove the cover on the underside of the Platform, unscrewing the two screws.

If the board is already set into the Platform, follow instructions on step 4.

3   Insert the board, pressing it gently but firmly, taking care to the connectors.

Fig. 33   View board and connectors

4 Insert the WIFI USB key into the connector of the board.

Fig. 34   WIFI USB set into the Platform

5 Screw back the cover onto the Platform.

An external USB dongle is also available (reference E60EWIFI).

Configuring the **1** Restart the SmartOTDR, pressing **ON** button.
WIFI access
2 On the **Home** page, press **Connectivity** .
The **Connectivity** page opens.

3 In the new page, select the **WIFI** icon .
The WIFI **Setup** screen displays.

4 Press **Wireless** menu key to enable the Wifi interface.
The icon is displayed on the upper banner.

Fig. 35   WIFI Setup screen

Once the Setup screen is displayed, configure the WIFI connection:

5 Press **Scan SSID** menu key to scan for Service Set Identifiers (SSIDs) in the area.

6 Wait for the list of SSIDs to be displayed.

Fig. 36   List of SSIDs found

7 Select the desired network to connect to.

8 Press **Select** menu key to validated the connection.

The display goes back to Setup screen.

The **SSID** parameter is automatically configured with the one selected.

9 In **Encryption** parameter, select the type of encryption wished: **None**, **WEP Static**, **WPA Personal**, **WPA Enterprise**.

10 According to encryption type selected, enter **Login** (if any needed) and **Key/Password**.

NOTE

Login and Password are kept in memory, even if the WIFI is deactivated or the SmartOTDR switch off and restarted.

11 In the **AutoConnect** parameter, select if the connection to SSID selected must be done automatically (**On**) or not (**Off**).

Connection to SSID Once configuration is valid, connect the SmartOTDR to the Wireless network:

1 In the Setup screen, press **Connect SSID** menu key.

or

If **AutoConnect** is defined to **On**, the connection is launched automatically.

Once association of Platform with SSID is established, the icon 📶 becomes 📶 to indicate the connection is active.

Configuring the WIFI mode to which the Platform is connected To work on WIFI with the Platform, configure the **802.11** parameter on the WIFI Setup screen.

1 Select the mode of connection:

Config 1 to 4	static mode enabling input of the configuration of 4 sites. If this parameter is selected, the following parameters must be entered:
– Site Name	the user can enter the name of the site in the Edit menu.
– IP Address	IP address of the SmartOTDR
– IP Mask	address of the mask of the sub-network
– IP Gateway	IP address of the machine enabling access outside the sub-network.
– DNS	(Domain Name Server) IP address of the machine providing the IP address on the basis of the name
– Domain name	name of the local network to which the Smart-OTDR is connected.
Dynamic	in this mode, which requires a DHCP server, the SmartOTDR requests an IP address from this server which will be allocated dynamically if dynamic host configuration is activated on the local network.
	After selecting this mode or after power-on, the SmartOTDR tries to establish a connection to

obtain an address from a DHCP server. If for any reason, this process fails, the SmartOTDR reverses to static IP address mode with User1 IP address.

Note the IP address of the Platform, to be able to remote screen on PC or to transfer files.

Note IP Address

Fig. 37 WIFI connection in Dynamic mode

2 Configure the **Proxy** dialog box:

In the **Use proxy** parameter

– Select **No** if no proxy is used.

– Select **Manual** to enter manually the **Proxy address**

– Select **Auto** and enter the **Pac address**.

Via Ethernet The connection between SmartOTDR and the PC can be done directly, or via a local network.

Connecting the **1** Connect the SmartOTDR to the PC via an Ethernet cable, using the
SmartOTDR and USB Ethernet - adapter and an ethernet cable.
the PC

Fig. 38 Connection SmartOTDR and PC

2 Make sure the network configuration onto the PC is set to the **Dynamic** mode:

  a Click on **Start** > **Control Panel**.

  b Double click on **Network Connection**.

  c Double click on **Local Area Connection**.

  d In the dialog box, click on **Properties**.

  e Check the parameter **Internet Protocol (TCP/IP)** is selected
        (⦿) and click once on it (underlined in blue)

  f Click on **Properties** button.

  g On the tab **General**, check the parameter **Obtain an IP address
        automatically** is selected (⦿); if not, click to select it.
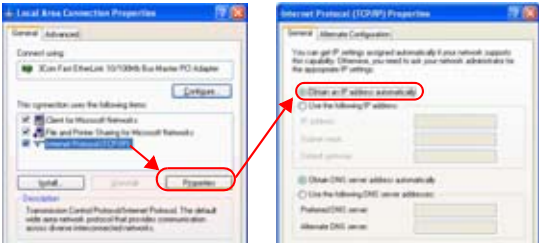
Fig. 39   Internet Protocol

  h Click on **Ok** and close all the dialog boxes opened onto the PC.

Configuring the **1** In the **Home** page, validate the **Connectivity** icon.
SmartOTDR via   **2** In the connectivity page, validate the **Ethernet** icon
Ethernet   **3** In the **I/O Interfaces** box, configure the following parameters:

Remote Screen

Remote screen = Session or **Permanent** must be confirmed in both
cases, in the Interface E/S window.

No	the screen cannot be remote on to a PC or on to another SmartOTDR.
Session Mode	the Remote screen function is inactive once the SmartOTDR is switched off.
Permanent Mode	the Remote screen function is still active when the SmartOTDR is switched off and restarted.
Permanent with password	same function as the Permanent mode, with an access to the equipment via VNC protected by a password: 42000

The password to access VNC can be modified:

1 Click on the menu key **Change password**.

2 Enter the current password in the Edition keypad and press **Enter** to validate.

3 Enter the new password and press **Enter** to validate.

Ethernet > Mode

Parameters of the local Ethernet network to which the SmartOTDR is connected:

Config 1 to 4   static mode enabling input of the configuration of 4 sites. If this parameter is selected, the following parameters must be entered:

– Site Name   the user can enter the name of the site in the Edit menu.

– IP Address   IP address of the SmartOTDR

– IP Mask   address of the mask of the sub-network

– IP Gateway   IP address of the machine enabling access outside the sub-network.

– DNS[1]   IP address of the machine providing the IP address on the basis of the name

– Domain name   name of the local network to which the Smart-OTDR is connected.

Dynamic   in this mode, which requires a DHCP server, the SmartOTDR requests an IP address from this server which will be allocated dynamically if dynamic host configuration is activated on the local network.

After selecting this mode or after power-on, the SmartOTDR tries to establish a connection to obtain an address from a DHCP server. If for any reason, this process fails, the SmartOTDR reverses to static IP address mode with User1 IP address.

━━━ | **NOTE**
Once the SmartOTDR is connected to the network, the icon indicates the connection is working.

_____

1.Domain Name Server

Proxy > Use proxy

1 Select **No** if no proxy is used.

2 If **Manual** has been selected, enter the **Proxy Address**.

3 If **Auto** has been selected, enter the **Pac Address**.

Note the SmartOTDR
IP Address

Fig. 40   Example of configuration for I/O Interfaces box

4 Note the IP Address.

5 Wait about 10 seconds the connection is established.

The SmartOTDR Interface can now be transferred onto the PC, or the internal memory or USB key contents can be transferred on PC.

Via Cloud Storage

Principle and prerequisites of the Cloud Storage

The Cloud storage defined the outsourcing of data on distant servers, which avoid the data storage on a local workstation.

The cloud storage onto a SmartOTDR allows to transfer the files from the Platform toward a distant server and vice-versa.

Before configuring the Cloud Storage on Platform, you must first create an account on a Cloud Platform on internet.

The Cloud storage function onto the SmartOTDR works exclusively with sites using the <u>WebDav technology</u> such as CloudSafe (https://secure.cloudsafe.com/pages/index.html) or Box (https://www.box.com/pricing/).

Once account is created, with WevDav configuration, you get the following information for connection:

– URL
– Login Name
– Login Password

Configuring and **Configuring the SmartOTDR**
connecting to
Cloud Storage on Once an account has been created on the Cloud site, configure the
the SmartOTDR SmartOTDR before establishing the connection:

> ⚠️ **Before configuring the Cloud Storage, make sure the configuration for Ethernet parameters and Proxy parameters are correctly configured.**
>
> See "Ethernet > Mode" on page 62 and "Proxy > Use proxy" on page 63.

1 On the **Home** page, press **Connectivity**.

2 In the **Connectivity** windows, press **Cloud/File Storage** .

A new page opens

3 In the **Url** parameter, enter the URL define for the Cloud server created on internet

4 In the **User** parameter, enter your Login created on your account

5 In the **Key / Password**, enter the password attributed by the Cloud server.

Configuration on Cloud server
(example with CloudSafe)

Configuration on SmartOTDR

Fig. 41 Example of configuration

Connecting Cloud Storage

Once configuration has been established on the SmartOTDR, it is ready to be connected with Cloud server:

1 Select one parameter of the Cloud Storage window on SmartOTDR

2 Press **Connect Cloud Storage** menu key .

The connection launches

3 Once connection is established, a message displays in the window

4 Press any key to continue, and start files transfer.

The icon is displayed on the upper banner as long as the connection is active.

Disconnecting from Cloud storage

To disconnect the SmartOTDR from Cloud storage:

1 Press **HOME** hard key.
2 Select a parameter of the **Cloud Storage** window.
3 Press **Disconnect Cloud Storage** menu key.

Remote Control

Smart Access Anywhere The SmartOTDR can be accessible to any network test locations, using a specific function: **Smart Access Anywhere**.

This function allows one distant user, on a PC, to transfer the Platform Interface and work on SmartOTDR or to access the internal memory / USB memory stick contents on the PC and perform files transfer from SmartOTDR to PC and vice-versa.

This feature does not need any licence code if the user wants assistance from a JDSU person located within the JDSU network.

This feature requires a licence code into the unit if the user wants any other assistance/support ("company A" willing to be remotely controlled by "company A or B").

The license **E10SAA-L2** is used for SmartAccessAnywhere using Ethernet, wifi hostpot connection, or USB / Wifi connection through 3G smartphone

The SmartOTDR can be used in combination with a PC in order to transfer the Platform Interface onto a PC, or to access the internal memory or USB memory stick contents on the PC.

Connection modes Different kinds of connection are available to access to a distant Smart-OTDR.

According to the connection type used, specific requirements are mandatory.

Ethernet or WIFI connection

1 Using the Ethernet connection, no specific requirement is needed. The SmartOTDR is directly connected to Internet via an Ethernet Cable.

Fig. 42   Ethernet connection

2 The WIFI connection can be used to access to SmartOTDR from any location.

This connection is available exclusively if the **WIFI option is installed onto the SmartOTDR** which will be seen remotely.

Fig. 43   WIFI connection

USB/WIFI connection through 3G Smartphone

To access to a SmartOTDR remotely, the connection between the unit and the JDSU application can be established via a USB cable or WIFI, and through a 3G Smartphone, having Internet Sharing capability via USB or WIFI.

1 To establish connection between SmartOTDR and Smartphone using USB, connect the USB cable on SmartOTDR and on 3G Smartphone connector.

Fig. 44 USB connection through 3G Smartphone

2 To establish connection between the SmartOTDR and 3G Smart-phone using WIFI, the **WIFI option must be installed onto the SmartOTDR**.

Fig. 45 WIFI connection through 3G Smartphone

Pre-requisite for using the Smart Access Anywhere Application To access to a SmartOTDR from any locations, specific requirements are mandatory:

– a licence installed on SmartOTDR which will be accessible from any locations.

- an Ethernet connection (the Platform must have an IP address - see "Ethernet > Mode" on page 53) and, if the network uses a proxy, this proxy must be configured (see "Proxy > Use proxy" on page 54).
- the JDSU application, delivered on a USB memory stick or downloaded for free at the address «`http://smartaccess.update-myunit.net`».
- port 22 (SSH) or 443 (HTTS) output opened
- according to connection mode selected:
  - the WIFI option installed on SmartOTDR
  - a USB cable to connect SmartOTDR with 3G Smartphone
  - a 3G Smartphone from given list and having appropriate basic subscription for internet connection sharing

Downloading the JDSU application on PC

The JDSU application **Smart Access Anywhere** must be downloaded on the PC which will be connected to the SmartOTDR remotely.

NOTE

It is not necessary to have administrator privileges to install the JDSU application on PC. This application is just saved on PC.

1 On PC, open an internet explorer and type the following address: `http://smartaccess.updatemyunit.net`

2 Click on the link **SmartAccessAnywhere_Vxx.xx.xx.zip**

3 Select **Save** in the dialog box.

4 Open the directory into which has been save the zip file and unzip files into a directory

5 Open the directory and double click on **SmartAccessAnywhere.exe**

The Smart Access Anywhere application opens:

Enter Access Code
(see)
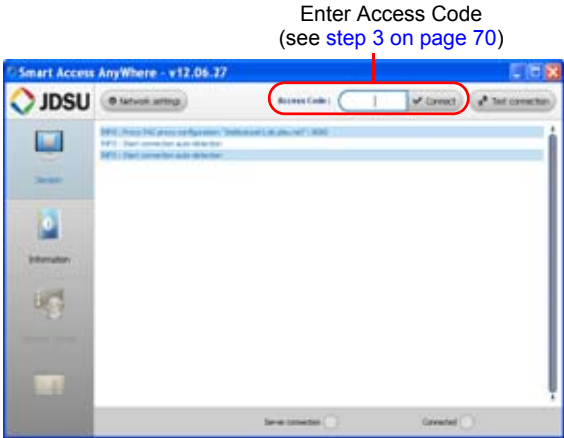
Fig. 46   Smart Access Anywhere: Connection page

If the software version is not the last one available, a message displays,
on the upper part of the screen to indicate the latest version available can
be downloaded at the address: http://smartaccess.updatemyunit.net.

Fig. 47   Warning message of a new version available

Launching the SmartAccess Anywhere application Once connection is configured, the SmartAccess Anywhere application
can be launched

On SmartOTDR

1 On the **Home** page, select the **SmartAccess** icon

As soon as the icon is selected, the SmartOTDR begin to connect to
SmartAccessAnywhere Server.

2 Once connection is established with the server, the SmartOTDR
displays a message with the code to be used to access to the equip-
ment remotely.

Fig. 48   Access code displayed

3   Note this access code and transfer it to the distant user, who will access the unit remotely.

4   Press **OK** to hide the message.

On the distant PC

1   On the PC of the distant user, once the application is launched, enter the Access Number on the upper part of the screen.

2   Click on **Connect** to validate ✔ Connect

The following screen displays:

Information on connection

Fig. 49   Smart Access Anywhere: Home page

⚠️ **After remote upgrade or reboot, please wait for more than 2 minutes before re-starting the link between the PC and the unit with SmartAccessAnywhere.**

Using Remote screen and File Transfer applications

Once the Introduction page is displayed, the user can work on distant SmartOTDR:

– transfer the interface to work on the unit (perform acquisition, configure the equipment...)

– transfer files from the equipment toward the PC, and vice-versa.

Transferring the interface onto the PC

To display the remote SmartOTDR onto the PC:

1 On the Introduction page, click on

   or

   On the left menu, click on

2 Click on **Start Remote Screen!** button

   The current screen of the SmartOTDR displays:

Virtual control buttons bar

Fig. 50 Smart Access Anywhere: Remote screen

   The VNC icon on the upper banner of the unit indicates the remote screen is active.

3 On the upper part of the screen, the virtual control buttons bar is permanently dipslayed and allows to emulate hard keys.

You may click on any of these buttons to obtain exactly the same results than using the hard keys on the front panel of the Smart-OTDR.

4   You can use keyboard mouse of the PC to control the SmartOTDR (see "Equivalence between the keyboard and SmartOTDR" on page 83).

Transferring files

To work on files (onto PC and onto unit):

1   On the Introduction page, click on .

or

On the left menu, click on .

2   Click on **Start Transfer Tool!** button Start transfer tool !

The file Explorer on PC and the one of the SmartOTDR displays:

PC
Directories and files

SmartOTDR
Storage media available
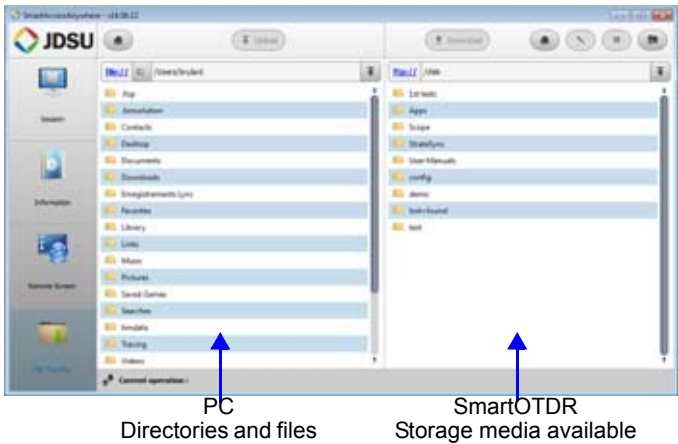
Fig. 51   File Transfer page

3   Double-click on one directory/storage media to display the contents (directories / sub-directories / files)

Navigation buttons

⌂	Return to the Home directory

click	Select the PC drive in the list
	Access to parent directory
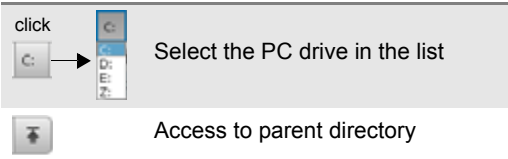
Transferring files from PC to SmartOTDR

1 On the SmartOTDR explorer, select the storage media, and if wished the (sub-)directory into which file will be transferred.

2 On the PC file explorer, select the file to be transferred

3 Click on the button **Upload** .

At the bottom of the screen, a new banner displays with information on file transfer:

1: location of the uploaded file on PC	3: level of transferred data
2: location of the file on SmartOTDR once transfer is completed	4: bar graph of the transfer in progress
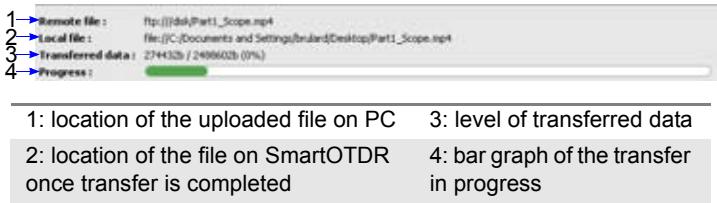
Fig. 52 Information on file transfer

Only one file can be uploaded from PC to SmartOTDR at the same time.

Once transfer is completed, the banner disappears and the transferred file is underlined in blue on SmartOTDR explorer.

Transferring files from SmartOTDR to PC

1 On the PC explorer, select the storage media, and if wished the (sub-)directory into which file will be transferred.

2 On the file explorer of the SmartOTDR, select the file to be transferred.

3 Click on the button **Download** .

A dialog box open, allowing to modify the location on PC of the file.

4 Select the directory into which file will be saved.

5 Press **Save** to start the transfer

Under both file explorers, a new banner displays with information on file transfer (see Figure 52 on page 73).

Once transfer is completed, the banner disappears and the transferred file is underlined in blue on PC explorer.

Working with files and directories on SmartOTDR

Renaming file or directory

1 Select a file/directory stored on the SmartOTDR hard disk or USB key.

2 Click on .

3 In the new dialog box opened, enter a new name for the file/directory, **keeping the file extension**.

4 Press **OK** to validate.
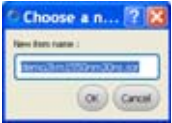
Deleting file

1 Select a file stored on the SmartOTDR hard disk or USB key.

2 Click on .

3 In the new dialog box opened, press **Yes** to confirm the deletion (or **No** to keep the file).
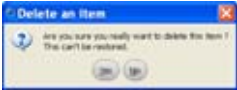
Creating a new directory

1 Select the storage and, if wished, the directory into which the new directory will be stored.

2 Click on .

3 In the new dialog box opened, enter a name for the new directory (*newdir* is given by default).

4 Press **OK** to validate.

The new directory is automatically created at the location selected.

Connection information and settings

Displaying session information

At any time during application use, the information about the session in progress can be displayed.

1 Press **Session** menu key on left of the screen .

A screen as the following one displays:
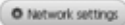
Fig. 53   Session page

This page gives information on connection «in real time».

Modifying connection settings

To modify the settings for connection to internet:

1 Press **Session** menu key on left of the screen .

2 Disconnect from application pressing ✔ Disconnect

3 On the session screen (see Figure 53 on page 75), press button
O Network settings .

The following screen displays:
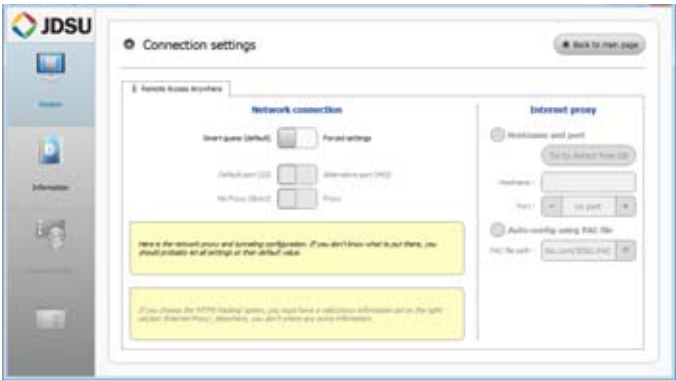
Fig. 54   Connection settings

By default, the connection is defined to **Smart-guess (default)**.

4 To modify the current parameters, select **Forced settings**.

Smart-guess (default) [ ] Forced settings

The parameters for Port configurations turn automatically active.

5 Modify, if necessary, the port used: **Default port (22)** is selected by default

6 Select **Alternative port (443)** if necessary

7 If the parameter **Alternative port (443)** is selected, you can defined if the proxy is used or not in the following parameter.

The **Internet proxy** configuration is available exclusively if the port selected is **Alternative port (443)** and if the **Proxy** is selected..

⚠️ **It is recommended to configure parameters of connection with your local network administrator, if the default parameters need to be modified.**

8 Once configuration is completed, press (🏠 Back to main page).

The **Home** page displays (see Figure 49 on page 70).

Testing connection

Before entering the Access code to activate the application, the connection to internet can be tested from displayed screen.

1 Open the Smart Access Anywhere application on PC

2 Press (🖋 Test connection) button

The test is automatically launched

3 Press (🔍 See full logs ...) to display logs in real time

Once completed, the results for connection display:
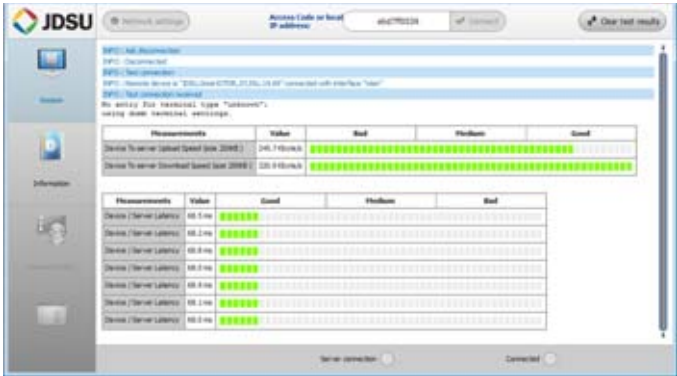
Fig. 55 Test results

The screen displays, in two different tables:

– the Upload and Download speed (in Kbyte/s) from Device to server.

– the Latency between Device and server (in ms).

4 Press [🖌 Clear test results] to delete the current table, and retest connection if wished.

5 If connection is valid, enter the access code and establish connection (see "Launching the SmartAccess Anywhere application" on page 69 - "On the distant PC" on page 70).

Data Transfer The SmartOTDR enables to transfer files, from or toward the product using Wifi, Bluetooth or Ethernet connection, or connecting two SmartOTDR together.

Transferring files via Bluetooth Once the connection has been established with a bluetooth device:

1 On the **Home** page, press **File Explorer** key to go in the File Explorer.

2 Select the file(s) to be transferred from the Platform toward the PC.

3 Push **Export** > **Send by Bluetooth** menu keys [Send by Bluetooth].

A confirmation message displays once the transfer is completed.
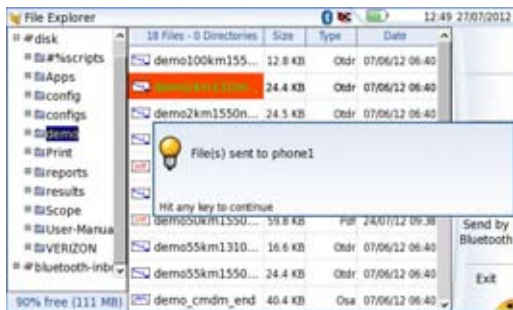
Fig. 56 Confirmation of files sending

You can also transfer file(s) from the bluetooth device toward the Platform.

In this case, the files received will be stored in a storage media created automatically on the Platform: *bluetooth-inbox*.

Fig. 57 Confirmation of file receiving

⚠️ **WARNING**
The files stored in bluetooth-inbox will be lost once the SmartOTDR is switched off. Copy/Paste the files to keep toward another storage media (disk, usb key...).

Transferring files to/from a PC via WIFI

Once connection is established between the Platform and the PC:

1 On the PC, use an FTP client, and access to internal memory via an internet explorer (I.E, Mozilla Firefox...) or Windows Explorer.

2 In the address bar, type the following address (`10.33.16.229` being the IP address of the SmartOTDR defined when the connection was configured):

`ftp://mts1000:JDSU@10.33.16.229/disk/`
This allows to access to internal memory.

`ftp://mts1000:JDSU@10.33.16.229/usbflash/`
This allows to access to the contents of the USB memory stick connected to the SmartOTDR.

⚠️ If you use Internet Explorer 7, the following address must be entered:

`ftp://mts1000:JDSU@10.33.16.229/acterna/user/disk` or
`ftp://mts1000:JDSU@10.33.16.229/acterna/user/usbflash`

3 If an identification is required, enter:

– User name: mts1000

– Password: JDSU

The PC then displays the contents of the internal memory or of the USB memory stick from the SmartOTDR.
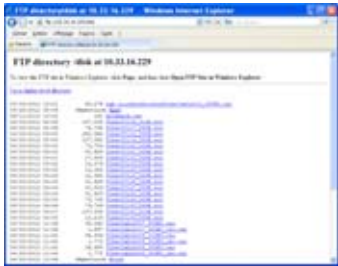
Internal memory open via Internet Explorer   Internal memory open via Windows Explorer

Fig. 58   Internal memory of the SmartOTDR

4 If internal memory of the Platform is accessible via Internet Explorer (or any other explorer), right click on one file and click on **Save target as...** to transfer file onto the PC.

If internal memory of the Platform is accessible via Windows Explorer, select one / several files and click on **Copy**, then click on **Paste** on PC to transfer file(s).

Transferring files using Cloud Storage Once connection between SmartOTDR and cloud storage server is successfully established (see "Configuring and connecting to Cloud Storage on the SmartOTDR" on page 64), the files can be transferred from one Platform to the other.

1 Press **HOME** hard key.

2 Press **Explorer** on the **Home** page

In the **Explorer** page, a new storage media is available: **cloud-storage.**

> ⚠ **The cloud-storage media is not available when File Explorer is opened from a FO application.**

3 Transfer the files from the disk or USB memory stick of the Smart-OTDR toward the cloud storage or vice-versa:

a Select the file(s) to be transferred

b Press the **Edit** > **Copy** or **Cut** menu keys

c Select the storage media (and the directory) into which files must be copied.

d Press **Paste** menu key

Edition menu
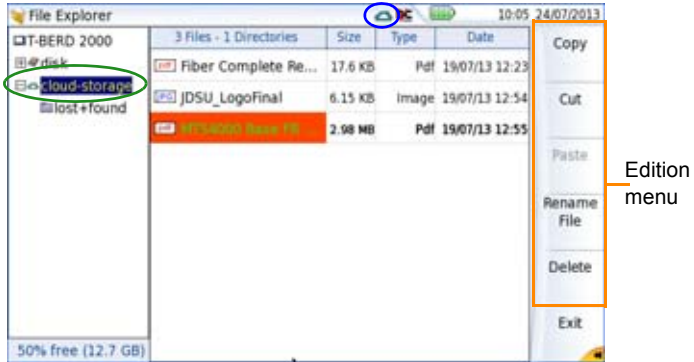
Fig. 59   File Explorer with cloud storage

> **The cloud storage is automatically disconnected once the SmartOTDR is switched off. Reconnect from the System Settings page of the SmartOTDR after the Platform restart.**

VNC The SmartOTDR can be used in combination with a PC in order to transfer the Platform Interface onto a PC, or to access the internal memory or USB memory stick contents on the PC.

The transfer of the interface can be done using a VNC window on PC.

> **For an intensive use of the deport screen or when it is used via a WAN network, it is strongly recommended to use a dedicated VNC client. The VNC clients recommended are Tight VNC (V 1.2.9 or later) and Real VNC (V 4.1.1 or later).**

Transferring the Once the IP address is displayed in the configuration screen.
interface on a PC
via WIFI **1** On the PC connected to WIFI with the Platform, open Internet Explorer.

2 Considering `10.33.16.229` is the IP Address of the SmartOTDR (as shown Figure 37 on page 60), enter the following address in the Internet Explorer window:

`http://10.33.16.229:5800`

3 Press **Enter** to validate.

The screen of the SmartOTDR appears offset on your PC.

Click to install TightVNC
software on your PC (not
mandatory)
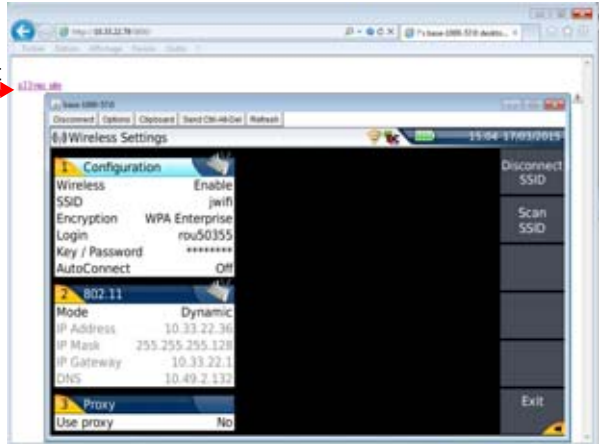
Fig. 60   VNC window

See "Virtual control buttons bar" on page 82 and "Equivalence between
the keyboard and SmartOTDR" on page 83 to get information on the
deported screen use.

Transferring the Once the connection is established between the SmartOTDR and the
Interface via PC, proceed as follow:
Ethernet **1**   Open Internet Explorer on the PC.

2   Considering 10.33.16.201 is the IP Address of the SmartOTDR (as
shown Figure 40 on page 63), enter the following address in the
Internet Explorer window:

http://10.33.16.201:5800

3   Press **Enter** to validate.

A VNC window opens, demanding a
password

4   Press **OK** without typing any password.

The screen of the SmartOTDR appears offset on your PC.

Click to install TightVNC software
on your PC (not mandatory)
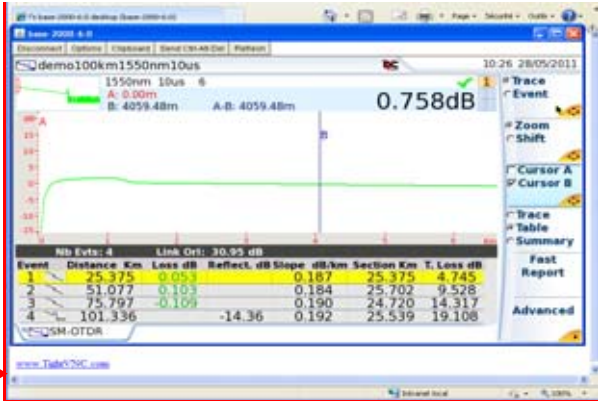
Fig. 61 VNC window

You can use keyboard mouse of the PC to control the SmartOTDR (see
"Equivalence between the keyboard and SmartOTDR" on page 83).

NOTE

Once Remote screen is accessible via VNC, the icon ![icon] displays
on the upper banner of the screen until the connection is cut or the
SmartOTDR is switched off.

Virtual control It is possible to emulate hard keys with Virtual Control buttons. This
buttons bar virtual control buttons bar is especially useful when the SmartOTDR
screen is exported on a remote PC.

To display those buttons, click once on the top of the screen in the status
bar, at the same height than the date and time.

Fig. 62 Virtual control buttons bar

The virtual control buttons bar is displayed during a few seconds. You
may click on any of these buttons to obtain exactly the same results than
using the hard keys on the front panel of the SmartOTDR.

Equivalence between the keyboard and SmartOTDR

The PC keyboard can replaced all the buttons and keys of the Smart-OTDR except the **ON/OFF** button**:**

– The menu keys to the right of the screen are replaced by the function keys **F1** to **F6**.

– The buttons below the screen are equivalent to **Ctrl +** a letter (see table below).

– The direction keys have the same function on the external keyboard and on the SmartOTDR.

Function on the SmartOTDR	**External keyboard**
HOME	Ctrl + H
SET-UP	Ctrl + U
FILE	Ctrl + F
RESULTS	Ctrl + R
START/STOP	Ctrl + S
EXPORT	Ctrl + P[a]
◀ ▲ ▶ ▼	← ↑ → ↓
Menu keys 1 to 6 (from top to bottom)	F1 → F6
ABOUT	F11
Save and quit (Exit)	Entrée/Enter
Quit without saving (Abort)	Escape/Echap.

a. The Export function is available directly on the SmartOTDR pushing simultaneously the left and right arrow keys.

NOTE

Those equivalences are also valid with a keyboard directly connected to the SmartOTDR via one USB port.

Stratasync

Principle and prerequisites of the Stratasync

Stratasync is a new solution that provides network operators with an agile and centralized way to manage and analyze data from thousands of deployed JDSU test instruments directly from the cloud.

StrataSync is a hosted, cloud-based software application that provides JDSU instrument asset, configuration, and test-date management.

StrataSync improves technician and instrument efficiency.

StrataSync allows to:

– Manages and tracks test instruments

– Collects and analyzes results from the entire network

– Informs and trains the workforce
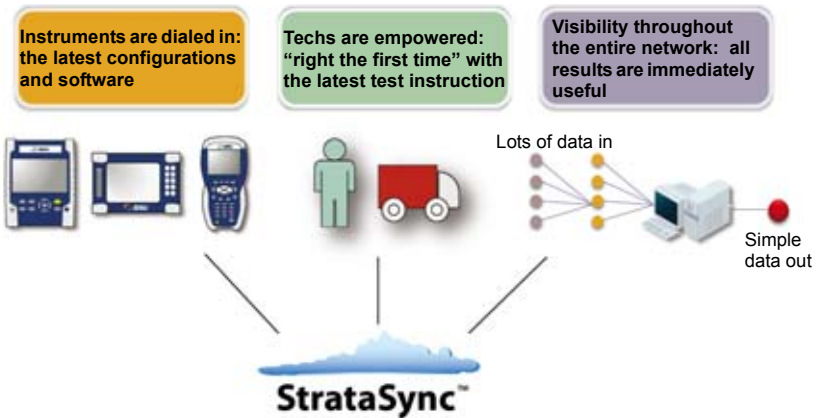
Fig. 63   Principle of the Stratasync application

Pre-requisites for using the Stratasync with the SmartOTDR

The user must have subscribed to Stratasync, and by consequence, he must have acquired an **account Identifier** and a **password**.

The Ethernet and Proxy parameters must have been correctly configured in the System Settings page of the SmartOTDR (see "Ethernet > Mode" on page 62 and "Proxy > Use proxy" on page 63).

Configuring and synchronizing the SmartOTDR The SmartOTDR can be configured to be synchronized with the Stratasync.

1   On the **Home** page, press **Connectivity**.

2   Check the configuration of the **Ethernet** and **Proxy** parameters (see "Configuring the SmartOTDR via Ethernet" on page 61).

3   In the **Connectivity** windows, press **Stratasync** .

4   Configure the Stratasync parameters:

   a   In the **Server Type** parameter, the **JDSU Server** is selected by default and it is recommended to keep this parameter. However, the user can select if necessary the **Server Name**

parameter and enter the name in the following parameter.

b In the **Account ID** parameter, enter the same identifier as the one used to access to Stratasync.

c The **Technician ID** parameter is automatically fulfilled after synchronization (if it has been defined by the administrator of the Stratasync)

d To upload the files from a directory onto the SmartOTDR toward Stratasync, select the parameter **Upload from** and press right arrow key to enter the directory path (example: disk/Strata-sync). The directory Stratasync is defined by default.

Fig. 64   Stratasync configuration

Connecting the SmartOTDR to Stratasync

Once SmartOTDR is configured in the **System Settings** page:

1 In **Home** page, press Stratasync icon [icon].

The synchronization with Stratasync starts

The icon [icon] displays on the upper banner of the SmartOTDR during synchronization.

Once the icon is no more displayed, this mean that the synchronization is completed.

2 For the first synchronization only, a message displays on the Smart-OTDR to indicate the addition of the equipment in Stratasync.

Fig. 65   First synchronization - Message on SmartOTDR

The SmartOTDR is now available in Stratasync.

File management

8

This chapter describes the files management using a SmartOTDR.

The topics discussed in this chapter are as follows:

File Explorer Overview

To reach the File Explorer page

– On the **Home** page, select the **File Explorer** icon.

The File Explorer page appears.
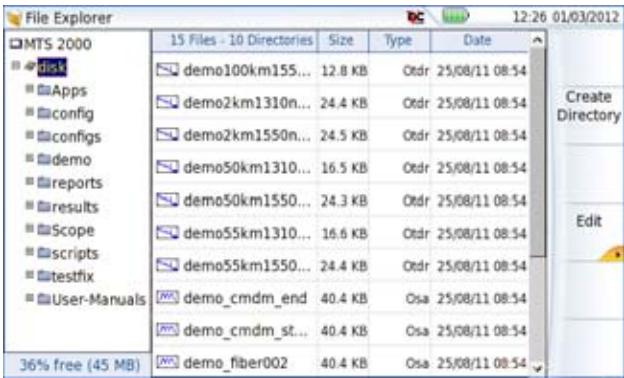
Fig. 66   File Explorer page

Directories and Files selections

Directory selection

To select a directory from the explorer page:

1   Press on the directory that must be selected on the left of the screen.

The list of files the directory contains displays on the right side of the screen

The selected directory is underlined in blue

2   Click on the arrow at the left of the directory name, or press valida-tion hard key ⚪ , to display the sub-directories if any.

Fig. 67   Directory selection

Files selection To select one or several files from the explorer page:

1 Press on files that must be selected.

   or

   To select a list of files using the keys of the Platform:

   a Select and validate the first file of the list (underlined in red)

   b Set the cursor on the last file of the list (underlined in blue)

   c Maintain the right direction key ▶ pushed until all the files are selected.

   or

   Click on **Select all** menu key to select all files into the directory.

NOTE

The last selected file is underlined in red and the previous one(s) selected is/are underlined in blue.

Selected files

Selected directory →

Fig. 68   Example of files selection

Directories & Files editing functions

Copy/Cut &   To copy (cut) one or several files, or one directory, and paste them in
Paste files/ another place:
directories

1 Select the directory / the file(s) (see "Directories and Files selections" on page 88).

2 Press **Edit** menu key

3 Press **Copy** to keep the directory / file(s) to their initial location.

or

Press **Cut** to delete the directory / file(s) from their initial location

4 On the left of the screen, select the directory; or select the new storage media.

5 Click on **Paste** menu key.

Renaming a directory / file

1 Select the directory / file to be renamed (see "Directories and Files selections" on page 88).

2 Press **Edit** > **Rename Directory** or **Rename File.**

The Edition keypad displays.

Fig. 69 Edition keypad for renaming file

3 Press **Clear** if you wish to delete the entire name

4 Enter a new name for the directory / file.

5 Click on **Enter** to validate the new name.

Deleting a directory / file

1 Select the directory or file(s) to be deleted (see "Directories and Files selections" on page 88).

2 Press **Edit** > **Delete.**

A confirmation dialog box displays.

3 Press **Yes** to delete the selected directory or file(s).

Press **No** to cancel the deletion.

Working with directories and files from the explorer

Creating a directory

To create a new directory from the explorer page:

1 Check the cursor is set on the left of the screen

2 Select the storage media into which the directory must be created

3 If you want to create a sub-directory, select the directory into which it must be created.

4 Press the right menu key **Create Directory**.

The edition keypad displays

5 Enter a name for this directory

6 Press **Enter** key to validate the new directory

Opening files Once a file is selected, press **Load** menu key.

> ⚠️ **Opening several files at the same time can be done exclusively with trace files (example: all OTDR trace files if a reference trace has been defined). Other type of files (PDF, TXT...) must be open one by one.**
>
> **If different types of files have been selected in the Explorer, only the last one selected will open.**

File Types For files recognized by the SmartOTDR, the types are symbolized by icons. E.g.

Icon	Type of FO file
〰️	OTDR file (.SOR extension)
〰️	Multi OTDR file (.MSOR extension)
-5dB	Power Meter file (.LTS extension)

Icon	Type of file
pdf	PDF File (.PDF extension)
TXT	Text file (.TXT extension)
LIC	License file (.LIC extension)
CSV	CSV file (.CSV extension)

Sorting files Wether files are selected or not, the key **Sort** allows to access to a sub-menu allowing to sort the file according to pre-defined parameters:

- – **Sort by name**: the files display in an ascending order (from A to Z). If you click once again on the key, the files display in a descending order (from Z to A).
- – **Sort by size**: by clicking once on this key, the files display from the smallest to the heaviest one. Clicking a second time allows to sort the files in opposite order.
- – **Sort by type**: clicking once on this key; the SmartOTDR displays files in an ascending order (the file type A to file type W). By clicking again, the SmartOTDR displays the files in opposite order.
- – **Sort by date**: clicking once on this key; the SmartOTDR displays files from the more recent to the less one. By clicking again on key, the Platform displays files from the older to the more recent one.

NOTE

You can also sort files clicking on the column titles in the files list

Transferring files between two SmartOTDR

If some Results traces or other kinds of file need to be transferred to another mainframe, or if files from another mainframe must be transferred to the SmartOTDR, this can be easily done using the USB cable delivered on standard with the equipment.

Establishing connection between two SmartOTDR

1 Connect the SmartOTDR to another one, plugging the USB cable on the mini USB port of the Platform toward a USB port on the other Platform.

USB cable

Mini USB Port on the SmartOTDR
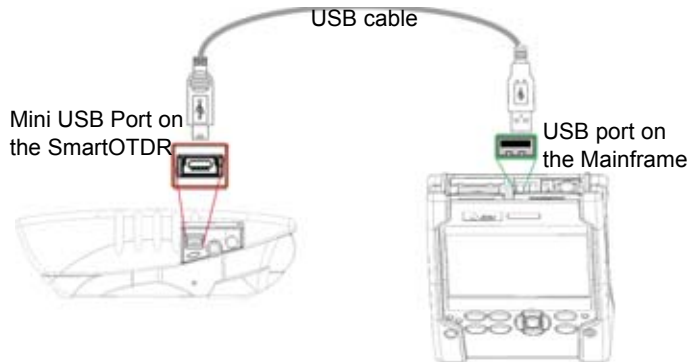
USB port on the Mainframe

Fig. 70 Direct connection SmartOTDR <-> SmartOTDR

2 Once connection is established, confirm that you wish to activate the USB link in the pop-up window on the SmartOTDR.
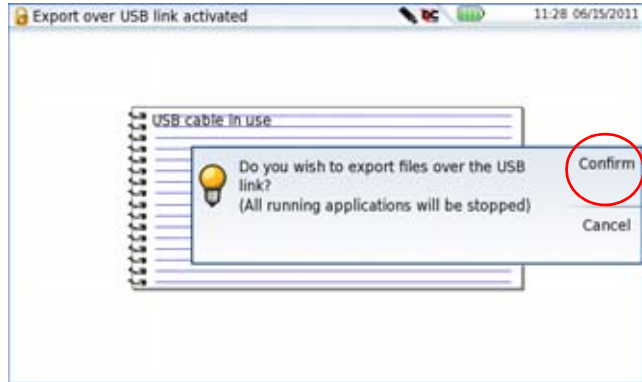
Fig. 71 Confirmation of files export via USB cable

Transferring files **1** On the distant Platform, open the File Explorer page

The usbflash driver appears ⏚ ☺usbflash on the left side of the screen.

2 Select the file(s) to be transferred from one Platform.

3 Press **Edit** > **Copy** or **Cut** softkeys.

4 Select on the left of the screen, the directory on the other Platform, into which file(s) must be transferred.

5 Press **Paste** softkey.

File(s) is/are transferred.

Cancelling the Once all desired files have been transferred, connection between both
connection SmartOTDRs can be removed:

1 On the distant platform, press **Eject USB** key before removing USB plug from connector.

2 On the SmartOTDR, remove the mini USB plug from its connector.

The screen displays the results trace of the active function, or returns to the **Home** page if no function is active.

Transferring If some Results traces or other kinds of file need to be transferred to the
files to a PC PC, this can be easily done using the USB cable delivered on standard
with the USB with the SmartOTDR.
cable

Establishing
connection
SmartOTDR <-> PC

1 Connect the SmartOTDR to a PC, plugging the USB cable on the mini USB port of the Platform toward a USB port on the PC.

USB port on the PC
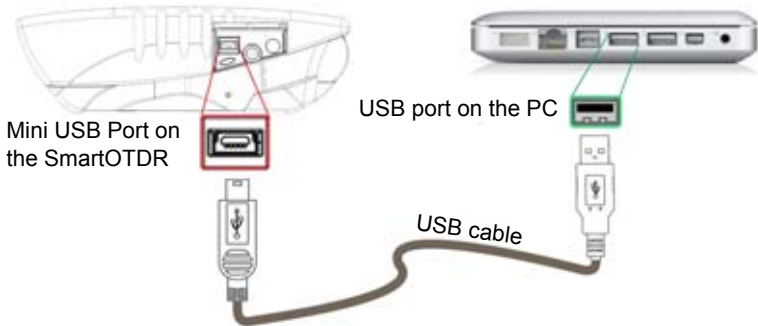
Mini USB Port on
the SmartOTDR

USB cable

Fig. 72 Direct connection SmartOTDR <-> PC

2 Once connection is established, confirm that you wish to activate the USB link in the pop-up window on the SmartOTDR.
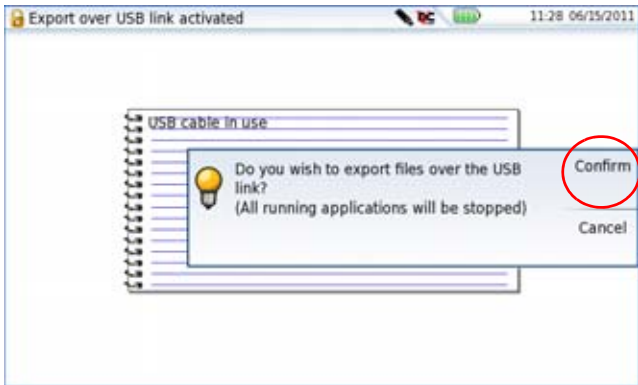

Fig. 73 Confirmation of files export via USB cable

A message displays on the bottom right side of the PC informing a new hardware is detected.

3 Click on the message and select «**Open folder to view files**» in the dialog box **JDSUDISK (F:)** («F:» is an example, it can be different according to your PC and to the USB port used).
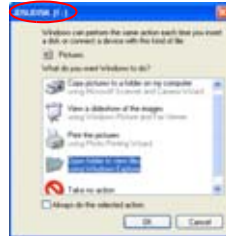
Fig. 74 Open SmartOTDR disk content

The SmartOTDR disk content opens onto the PC.

Transferring files onto the PC
1 Select the file(s) from the SmartOTDR to be transferred onto the PC
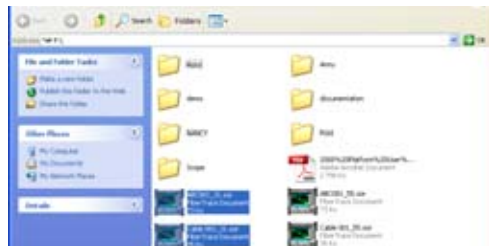
Fig. 75 Files selection from the SmartOTDR

2 Press **Ctrl + C**, or right click and select **Copy**.
3 On the PC, select the directory in which file(s) will be transferred.
4 Press **Ctrl + V**, or right click and select **Paste**.

Cancelling the connection
Once all desired files have been transfer onto the PC, connection between SmartOTDR and PC can be removed:

1 On the PC, use the appropriate method to safely remove the USB cable from the USB port.

The screen displays the results trace of the active function, or returns to the **Home** page if no function is active.

2 Remove the mini USB plug from the SmartOTDR USB port.

Creating a screenshot

You can create captures of what is displayed on the screen, directly from the SmartOTDR and save it into a pdf file.

Taking a screenshot

Once the screenshot parameters are configured:

1   Reach the display which will be saved as a screenshot in a file.

2   If necessary, make modifications on this display (example: zoom on trace...)

3   Press simultaneously the left and right arrow keys ◀ ▶ for about 5 seconds

      or

      Click on the upper banner of the screen and, in the virtual control buttons bar, press **Export** key

      The icon 🖨 displays until the end of process.

4   Press the **FILE** key to find the PDF file in the Explorer

Name of the screenshots files

The screenshot is saved in a file, which is automatically named as follow:

–   *Print_date (year/month/day)_time (hour/minute/second).pdf*

Fig. 76   Example of screenshot, open on the SmartOTDR

The file is saved in the directory **Print**, on the storage media **disk**.

Merging pdf or txt files

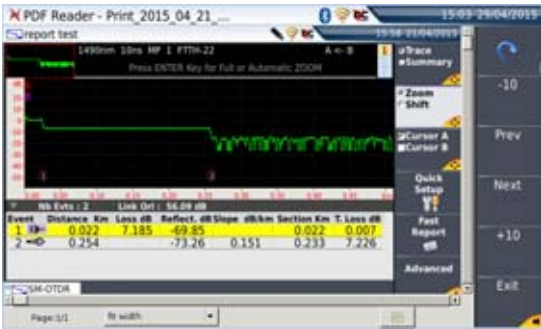In the Explorer page, two <u>pdf/txt</u> files or more, generated via the results traces can be merged in one pdf file.

– The pdf files that can be merged are those generated via the **Fast Report** key on trace results page or via the **Export** key on the upper banner (or left and right arrow keys).

– The txt files that can be merged are those saved with the results trace (see OTDR Application User Manual).

1 In the Explorer, select the two or more pdf/txt files generated

2 Press **Export** menu key

3 Press **Merge** key
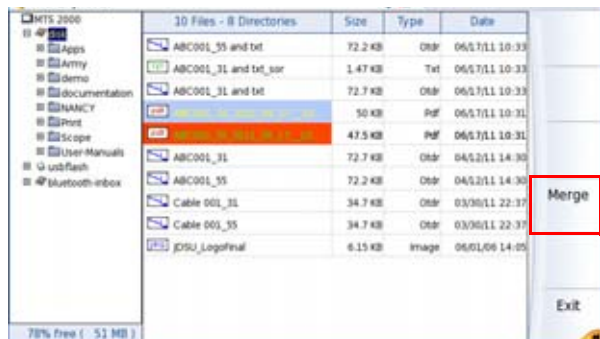
Fig. 77   Files selection and Merge key

The icon is displayed during merging process.

After a few seconds, the files are merged in one pdf/txt file, which name by default is: *merged_year_month_date__hour_min_sec*.pdf

The file is automatically saved in the same directory as the one where files have been selected.

It gathers all results from pdf/txt files selected (and traces for pdf file), in one single pdf file of several pages (1 results screen per page, if the results table does not exceed one page).

NOTE

Once merged file is saved, it can be renamed in the Explorer (see "Renaming a directory / file" on page 90).

Storage media

For saving or recalling data, the SmartOTDR offers a wide choice of media, both built-in and external.

Free space on selected media is clearly displayed at the bottom of the left panel.

Storage media built into the SmartOTDR
The SmartOTDR is delivered with an internal memory, which maximum capacity is of 2GB (with a minimum of about 128 Mb are available for data storage).

External USB storage media
The SmartOTDR is equipped with 2 USB ports as standard. One of these can be used to connect an external storage medium, in particular a USB memory stick.

> **NOTE**
>
> Although two USB ports are present, it is not possible to use simultaneously more than one external USB storage medium.

USB memory stick connection
1   Insert the USB memory stick in one of the SmartOTDR's USB port.

A sound is emitted to confirm the successful insertion and recognition of a USB memory stick.

Then, the icon   is displayed in the upper banner to inform the user the USB stick is ready to be used.

⚠️ **When a file is moved in the explorer of the Platform, the end of the move on the screen does not mean that writing of data into the memory is complete. Some data may still be in a writing process if the storage unit is removed prematurely.**

USB memory stick disconnection
1   Before disconnecting the USB memory stick, always select a storage device different from usbflash (select disk for example) in the explorer.

2   Make sure you no longer have any running applications using the usbflash storage media.

3   The user must push the **EJECT USB** key, available in **File Explorer**.

The icon becomes   to indicate it can be removed safely. In this state, the USB stick cannot be used anymore

The USB memory stick can then be disconnected from the Platform USB port.

━━━━ | **NOTE**

The USB memory stick can also be removed using the **Expert Tools** > **Media Utilities** menu, accessible via the **System Settings** page.

See Chapter 11 "Maintenance and Troubleshooting" if any problem occurs with the USB memory stick

Abbreviations for storage media

The abbreviations used in the explorer for the different storage media are:

Abbreviation	Storage medium
disk	Internal flash memory
usbflash	USB memory stick
bluetooth-inbox	Bluetooth storage media (option)[a]
cloud-storage	Cloud storage media available on PC

a. The files stored in bluetooth-inbox are lost when the Smart-OTDR is switched off.

Technical specifications (preliminary)

This chapter contains the technical specifications of the SmartOTDR mainframe.

The topics discussed in this chapter are as follows:

General specifications

Display specifications

Screen

– Backlight high visibility color capacitive touchscreen
– Size: 5 inches

Resolution

– 800 x 480 pixels

Memory

Standard memory: internal memory, with a capacity of 2GB (with a minimum of about 125 Mb are available for data storage).

Input/Output

– Two USB 2.0 host ports.
– One Mini USB 2.0 device
– Built-in buzzer
– Built-in WIFI (optional)
– Built-in Bluetooth (optional)

Battery

The instrument can be supplied with one Li-Polymer battery.

Endurance of the SmartOTDR with battery

Measurement conditions:

– at +25 °C,
– at full battery capacity (4.8 Ah),

Conditions of use	Endurance Li-Polymer battery
According to Telcordia GR-196-CORE recommendation: Normal conditions, with normal backlight, 3 acquisition of 30 seconds per quarter of hour, auto off	up to 20 hours
Under continuous acquisition, with high screen backlight: with a E136FB SmartOTDR	Up to 6h

Mains adapters

	Standard Mains Adapter
Input	100-250 V, 50-60 Hz
Output	12V DC 2.5 A max
Compliance	EN 60950

Supply or Power assigned in AC and in DC: 25 W

Dimensions - Weight

Dimensions
175 x 138 x 57 mm (6.9 x 5.4 x 2.4 in)

Weight
About 900 gr (1.98 lb)

Environment

Temperature
– Operating temperature range: -20°C to +50°C (-4°F to +122°F)
– Operating temperature range with guaranteed specifications: 0°C to +40°C (+32°F to +104°F)
– Storage: -20°C to +60°C (-4°F to +140°F)

Humidity
– 5 to 95% without condensation

EMI/ESD
– CE Compliant (EN61326-1)
– FCC 47-1 Part 15 Compliant

Drop test In accordance with the Telcordia GR-196-CORE recommendations, the SmartOTDR resists the following test:

– 6 impacts dropped from a height of 76 cm on a pinwood floor of 5 cm thickness (1 impact on each of its 6 sides, with power off).

Shocks The SmartOTDR resists the following test:

–   3 shocks per axis along each of the 3 axes, with power off.
–   Impacts of 15g, 1/2 sine, duration 11 ms, at 10 second intervals.

Bumps The SmartOTDR resists the following test:

–   1,000 bumps per axis along each of the 3 axes, with power off.
–   Jolts of 15g, 1/2 sine, duration 6 ms, at 1 second intervals.

Vibration The SmartOTDR resists the following vibration tests:

–   Complete test comprising 6 cycles along each of the x, y and z axes.
–   One cycle of 5 to 200 Hz and back to 5 Hz with a sweep duration of one minute/octave.
–   3 mm amplitude displacement test, for the range 5 Hz to 15 Hz.
–   3g acceleration test for the range 16 Hz to 200 Hz.

Flammability The SmartOTDR housing (in ABS, type V0) does not propagate fire.

Characteristics of the Source (standard) and Power Meter (optional)

Source –   Output Power Level[1]: -3.5 dBm
–   Stability long term (8h): +/- 0.05 dB[2]

Power meter (through OTDR port) Specifications given for 25°C, after 20 minutes stabilization time and after zero setting.

–   Calibrated wavelengths: 1310 / 1490 / 1550 / 1625 / 1650 nm
–   Accuracy at calibrated wavelengths: ± 0.5 dB (at -30 dBm)
–   Input power range: -60 dBm to +10 dBm
–   Maximum resolution: 0.01 dB / 0.01nW
–   Measurement range:0 to -55 dBm

1.+/- 1 dB
2.After 30min light source stabilization time

–   Linearity: ± 0.5 dB[3]

Characteristics of the options

VFL   –   Wavelength: 650 nm

–   Length of fiber: up to 5 km

–   Class 2 laser (standards EN60825-1 and FDA21 CFR Part 1040.10).

Bluetooth and WIFI   –   WIFI: standard IEEE802.11n

–   Bluetooth Option

–   Class 2

–   Range: up to 20 meters

–   Bluetooth V2.1 + EDR

Characteristics of the OTDR

OTDR Optical Interfaces   Interchangeable optical connectors: FC, SC[4]

OTDR Optical characteristics

Laser safety class (21 CFR)	Class 1
Distance units	Kilometer, meter, feet, and miles
Group index range	1.300000 to 1.700000 in 0.00001 steps
Number of data points	Up to 256,000 data points
Distance measurement	Automatic or dual cursor
Display range	0.1 km to 260 km for single-mode
Cursor resolution	1 cm

3.from -5 dBm to -50 dBm
4.SC mandatory for E136FB configuration

Sampling resolution	4 cm for single-mode
Accuracy	±1 m ±sampling resolution ±1.10–5 * x distance (Excluding group index uncertainties)

Characteristics of reflectometry measurements

Distance measurement

– Automatic or Dual cursor

– Distance displayed takes into account the calibration of the refractive index of the fiber.

– Index adjustable from 1,30000 to 1,70000 in steps of 0,00001

– Resolution of display: 1 cm max.

– Resolution of cursor: 1 cm max.

– Spacing of measurement points: from 4 cm, with up to 256 000 acquisition points.

– Accuracy: ± 1m± sampling resolution ±1.10^{-5} x distance (excluding errors of calibration of refractive index of the fiber).

– Display span: 0.1 km m to 260 km for single mode

Attenuation measurement

– Automatic, manual, 2-point, 5-point, and LSA

– Resolution of display: 0,001 dB

– Resolution of cursor: 0,001 dB

– Linearity: ± 0.05 dB/dB for single mode

– Display span: 1.25 dB to 55 dB

Reflectance / ORL Measurement

– Resolution of display: 0,01 dB

– Accuracy: ± 2 dB

Automatic measurement

– Automatic measurement of all the elements of the signal. Slope measurement by least squares or 2 points of measurement.

– Display threshold of faults:
- 0 to 5.99 dB in steps of 0.01 dB for event thresholds
- -11 to -99 dB in steps of 1 dB for the reflectance
- 0.01 to 5.99 dB in steps of 0.01 dB for attenuation

– Display of slope and attenuation for a segment of fiber.

– Display of the position of a fault and of attenuation.

– Display of the reflectance of the fault.

– Display of ORL

Manual Measurement

– Measurement of slope between the cursors.

– Measurement of attenuation between two segments of fiber.

– Measurement of reflectance of a reflecting element.

– Measurement of ORL between the two cursors.

– Measurement of splice by 2 or 5 points method

Typical specifications

Typical values, measured at 25°C unless specified.

	E136FB (2 ports)	E126A
Central Wavelength[a]	1310 +/- 20nm 1550+/- 20nm filtered 1625 nm +/- 20nm	1310 nm +/- 20nm 1550 nm +/- 20nm
Typical RMS Dynamic Range[b]	40 / 40 / 41 dB	34 / 33 dB
Distance Range[c]	Up to 150 km	Up to 100 km
Pulse width	3 ns to 20µs	5 ns to 20µs
Event Dead Zone[d]	0.90 m	1.35 m
Attenuation Dead Zone[e]	2.5 m	4.5 m
Splitter Attenuation Dead Zone	45 m after 15dB splitter loss	N/A

a. Laser, at 25° C and measured at 10 µs
b. Typical value corresponding to the one-way difference (in dB) between the extrapolated backscattering level at the beginning of the fiber and the RMS (SNR = 1) noise level, after 3 minutes averaging, using the largest pulse width.
c. At 1550 nm
d. EDZ measured at +/- 1.5 dB below the peak of a unsaturated reflective event using the shortest pulse width.
e. ADZ measured at +/- 0.5 dB from the linear regression, using a FC/UPC- type reflectance, at shortest pulse width.

Options and accessories

This chapter shows the references of the options and accessories of the SmartOTDR.

The topics discussed in this chapter are as follows:

References of the SmartOTDR

OTDR Configurations[a]	Reference
SmartOTDR 1550nm A Range Handheld Tester With Continuous Light Source & PC Connector	E100A-PC
SmartOTDR 1550nm A Range Handheld Tester With Continuous Light Source & APC Connector	E100A-APC
SmartOTDR 1310/1550nm A Range Handheld Tester With Continuous Light Source & PC Connector	E126A-PC
SmartOTDR 1310/1550nm A Range Handheld Tester With Continuous Light Source & APC Connector	E126A-APC
SmartOTDR 1310/1550nm & Filtered 1625nm B Range Handheld Tester With Continuous Light Source & PC Connector[b]	E136FB-PC
SmartOTDR 1310/1550nm & Filtered 1625nm B Range Handheld Tester With Continuous Light Source & APC Connector	E136FB-APC

a. Comes with AC/DC converter/adapter, hands-free carrying case, stylus and getting started manual.
   OTDR connector adapter and battery type (LiPo mandatory for E126A and E136FB) are not included.
b. available with SC OTDR connector adapter (EUSCADS) only

OTDR Connector Adapters	Reference
SC Universal Adapter	EUSCADS
FC Universal Adapter	EUFCADS

Battery	Reference
Lithium Polymer battery for SmartOTDR (tray + batteries) (see "Changing the battery" on page 129)	E10LIPO

Power Meter / VFL options	Reference
Built-in VFL option with UPP 2,5 & 1,25 mm connectors for SmartOTDR	E10VFL
Optical power meter option for SmartOTDR (same port as OTDR)	E10PM
MP-60A;USB Optical power meter with accessories	MP-60A
MP-80A;USB Optical power meter high power with accessories	MP-80A

WIFI / Bluetooth options	Reference
Built-in WiFi Option for SmartOTDR	E10WIFI
Built-in Bluetooth Option for SmartOTDR	E10BLUE
External WiFi USB Dongle	E60EWIFI
External Bluetooth USB Dongle	E60EBLUE

References of accessories

Scope	Reference
Digital Videoscope kit including FBP-P5000i probe (USB2.0) in a small soft case, and 7 tips in a box (FC, SC, SC-APC, LC, U25M, U25MA & U12M)	EDFSCOPE5Ki

Carrying Cases	Reference
Hands-free soft case with neckstrap for SmartOTDR (Standard with all configurations)	E10GLOVE
Large carrying soft case for SmartOTDR	E40SCASE1

Mains options	Reference
12V Car lighter adapter for SmartOTDR	E40LIGHTER
EU/US to India type D power adapter	EINDIADPLUG

References of firmware applications

Applications for SmartOTDR	Reference
FTTA-SLM OTDR Application for SmartOTDR	ESMARTFTTA-100
FTTH-SLM OTDR Application for SmartOTDR	ESMARTFTTH-100
SLM OTDR Software Option for SmartOTDR	ESMARTLINK-100
CABLE-SLM OTDR Software Option for SmartOTDR	ESMARTCABLE-100
Smart Access Anywhere for SmartOTDR -L2: Remote coaching and file transfer for SmartOTDR using Ethernet, WIFI and selected 3G Smartphone (via USB or WIFI)	SAA-100-L2

Maintenance and Troubleshooting

11

This chapter describes how to maintain your unit and identify and correct problems related to the SmartOTDR.

The topics discussed in this chapter are as follows:

- – "Maintenance procedure" on page 114
- – "Recycling Information" on page 127
- – "Troubleshooting" on page 127
- – "General information on warranty" on page 131

Maintenance procedure

Maintenance work on this instrument must only be undertaken by qualified personnel using suitable equipment.

In most cases, it is advisable to contact the nearest JDSU Service Centre, which will undertake the appropriate troubleshooting and repair work.

The performance and technical complexity of the SmartOTDR class this instrument in a new generation of equipment, for which JDSU has laid down a maintenance policy based on the principle of standard module replacement.

In implementation of this policy, we have set up powerful card trouble-shooting test resources in our factories and a rapid dispatch system operating between our factories and branches.

Only by this procedure can the high quality of the instrument continue to be ensured after repair work. This procedure also has the advantage of reducing repair costs and time.

In the interests of quality and efficiency, we strongly recommend adoption of the following procedure in the event of a fault, before any other steps are taken:

– Verify that the instrument is plugged in.

– Check the connections of any peripheral equipment to the Platform.

– If a fault is detected, or in case of doubt, it is advisable to contact the nearest JDSU Service Centre, which will undertake the appropriate repair work.

Cleaning

Cleaning plates and housings The front and rear plates and the housings may become tarnished with handling. To clean them, use only a rag moistened with soapy water. Never use any product containing acetone, trichlorethylene, benzine or alcohol, as these will attack the printed markings.

Cleaning the screen To clean the screen, use an antistatic product.

Cleaning the optical cable connector – Use a non-fluffy type of paper, such as Joseph paper, soaked in isopropylic alcohol.

– Pay particular attention to the polished face of the fiber, rubbing it in a direction perpendicular to the axis of the fiber.

Cleaning the optical connections of the SmartOTDR
– Squirt a highly volatile solvent (such as isopropylic alcohol) into the connector.
– Blow out the connector using a clean dry air supply from an aerosol can fitted with an extension.

NOTE

If your equipment has a universal connector, unscrew its adaptor to access the ferule.

Accessing to the SmartOTDR information
On the SmartOTDR, some screens allows to display information on different elements of the equipment.

To display the information on the SmartOTDR

1 On the **Home** page, validate **Settings** icon to reach the **System Settings** page.

2 On the right menu keys, press **About** to display the presentation screen of the SmartOTDR.

General page
The **General** page is displayed by default, and allows to display the presentation screen, with all the information concerning the software versions, the hardware options and the OTDR module.

Fig. 78   General page

This page shows:

– The software version information

    – The product contents: base, optical options, battery type, touch-screen used, module type and date of calibration for options.

      The options set into the SmartOTDR are marked with a green tick.

Software options   This page allows to visualize the software options available on the Smart-
page   OTDR.

    1   Once on the **About** screen, press **Software Options** menu key to display the list of software options available on your SmartOTDR.
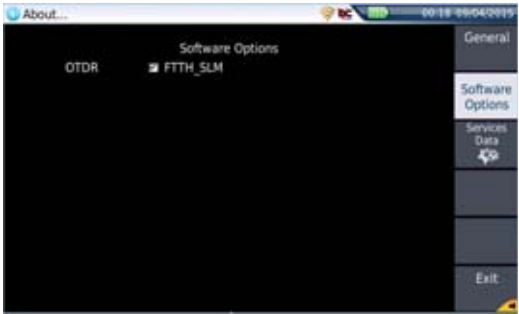
      Fig. 79   Software Options page

Services Data page   This page allows to display information about the elements inside the SmartOTDR (CPU, Memory, hardware revision, screen reference...).

    1   Once on the **About** screen, press **Services Data** menu key to display the list of elements contained on your SmartOTDR.
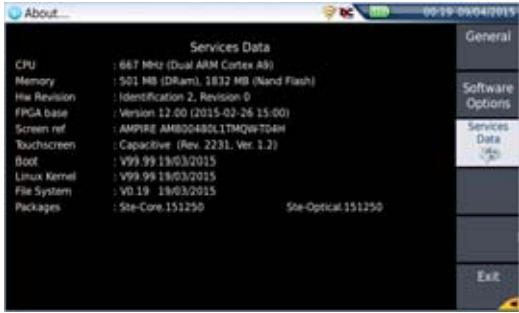
      Fig. 80   Services Data page

Installing a new version of the software

> ⚠️ When a new software version is loaded, there is a risk of re-initialization of the internal memory. Before installing the new software, it is therefore advisable to save the results in the memory, using the **Save** function called up by the **FILE** button.

> ⚠️ Do not interrupt the installation process, as this could damage the instrument.
>
> To avoid any interruption of the installation procedure, the Smart-OTDR must be operating on the mains: if the procedure is started while operating on battery, a message indicates that the instrument must be connected to the mains.

Downloading from Internet When the software is obtained from the Internet, it must be saved on a storage medium before the software upgrade of the product can be carried out. To do this:

1 Open Internet Explorer

2 Enter the internet address `http://www.updatemyunit.net`, which will give access to the installation portals for all JDSU products.

3 Click on the link **SmartOTDR**.

4 According to your region, click on the one of the following icon to download the archive.

Download from European server

Download from North American server

Download from Singapore server

5 In the new dialog box displayed, click on **Save** to save the exe file on the PC.

6 Once completed, connect the USB memory stick to the PC and follow the instructions chapter "Installation from a USB memory stick" on page 120, from step 2.

Installation from JDSU Server The update can be performed directly onto the equipment, using the JDSU server.

1 Connect the SmartOTDR to a PC via the USB <-> Ethernet adapter and an Ethernet link.

2 On the **Home** page, press **Connectivity** icon .

3   Press Upgrade icon .

4   In the **Upgrade Server** box:

– On the line **Address Type**, select **JDSU Server**

The address **smartotdr.updatemyunit.net** is automatically displayed.

5   Select if the new release for SmartOTDR must be automatically detected (**Enable**) or not (**Disable**). See "Checking new upgrade on JDSU Server" on page 122.

Fig. 81   Configuration of the JDSU Server

6   Press **Exit** to return to Connectivity page.

7   Press **Ethernet** icon.

8   In the line **Ethernet**, select **Mode**: **Dynamic**.

9   In the **Proxy** box, on the line **Use proxy**, select **No**, **Manual** or **Auto** wether a proxy is used or not.

10 Press **Exit** twice to return to **Home** page.

11 Press **Settings** icon .

12 Press, in succession the menu keys: **Expert Tools > Upgrades > Software Upgrade > Upgrade via Ethernet**.

The message `Verify IP address of PC server` appears.

13 Click on **Continue**.

The list of the software versions available on the PC is displayed next to the versions installed on the SmartOTDR.

Fig. 82 List of software versions (current and new)

Installation from another server Before starting the software upgrade via Ethernet, make sure the IP address of the PC server.

The update can be performed directly onto the equipment, using an http address.

1 Connect the SmartOTDR to a PC via an Ethernet link.
2 On the **Home** page, press **Connectivity** > **Ethernet** icons.
3 On the line **Ethernet**, select **Mode**: **Dynamic**.
4 Press **Exit** to return to Connectivity page
5 Press **Upgrade** icon
6 In the **Upgrade Server** box:
   – On the line **Address Type**, select **Server Name** or **IP Address**.
   – Enter the Server Name (if **Server Name** has been previously selected) or the Server Address (if **IP Address** has been previously selected)
7 Press **Exit** to return to **Connectivity** page
8 Press **Ethernet** icon
9 On the line **Use proxy**, select **No**, **Manual** or **Auto** wether a proxy is used or not.
10 Press **Exit** twice to return to **Home** page.
11 Press **Settings** icon .
12 Press, in succession, **Expert Tools > Upgrades > Software Upgrade > Upgrade via Ethernet**.

The message Verify IP address of PC server appears.

13 Click on **Continue**.

The list of the software versions available on the PC is displayed next to the versions installed on the SmartOTDR (see Figure 82 on page 119).

Installation from a USB memory stick

You must be equipped with a USB memory stick with a minimum capacity of 128 Mo.

Before installing the upgrade, you must format the USB memory stick (see "Formatting the USB memory stick onto the SmartOTDR" on page 128).

1 Once formatted, disconnect the USB memory stick from the Smart-OTDR using the key **Eject USB** in the Media Utilities page.

> As for any media formatting, please note that all data present on the USB memory stick will be irremediably lost.

2 Connect the USB memory stick to the PC

3 Unzip the upgrade files on the PC and transfer it to the USB memory stick:

a Download and save on your PC the.exe upgrade file that you can get from the web (http://updatemyunit.net see "Downloading from Internet" on page 117).

b Once the transfer is completed, double click on the.exe file: A window will appear. Check that the folder is correct i.e. the USB memory stick driver is appearing in the line at the bottom of the dialog box then press OK. If not, click on the icon 📁 in order to select the right USB drive.
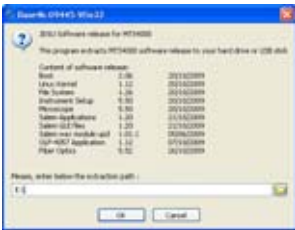

Fig. 83 List of software update

c Press **OK** and wait for the end of loading.

4 Then remove the USB memory stick, using the appropriate procedure, from your PC

5 Insert the memory stick into one of the USB ports on the product.

NOTE

A bip is emitted each time the USB memory stick is inserted or removed from the USB port.

6 On the Home page, press **Settings** icon .

7 Press successively **Expert Tools > Upgrades > Software Upgrade > Upgrade from USB**.

The message Are you sure? is displayed

8 Click on **Confirm**.

The list of the software versions available on the USB stick is displayed next to the versions installed on the SmartOTDR (see Figure 82 on page 119).

Launching the upgrade Whatever is the method selected for upgrade (Server, USB key...) and once the list of the software versions available is displayed next to the versions installed on the SmartOTDR (see Figure 82 on page 119), follow these instructions to launch the upgrade:

1 Click on **Show Prev choice** or **Show Next Choice** to display the previous and next versions available.

2 Click on **Confirm this Choice** to start the upgrade of the selected software(s).

or
Click on **Confirm All Choices** to upgrade all versions.

NOTE

The software versions list does not always appear (cf previous versions) as well as the **Previous / Next Choice** buttons and the **Confirm/Continue** key. In this case, the upgrading starts automatically.

Upgrading begins. The SmartOTDR is automatically rebooted. Upgrading takes several minutes. Finally, the SmartOTDR is automatically restarted.

During the upgrade, the Testing indicator is lit in red. Do not push any button or remove the USB memory stick while the indicator is lit. The USB stick can be removed if necessary once the Testing indicator is off.

Checking new If the JDSU Server is selected for upgrade (see Figure 81 on page 118),
upgrade on JDSU the parameter **Check new release** can be defined to automatically
Server inform user of a new upgrade available for Platform.

1   In the **System Settings** screen, select **Connectivity** > **Upgrade**
    icons.

2   Check the **Address Type** is set to **JDSU Server**.

3   Define the parameter **Check new release** to **Enable**.

    If the parameter is set to **Enable**, a message displays, at any time,
    when one update is available on server.

Fig. 84   Checking new release

4   Press **Ok** to display the list of software versions available (see
    Figure 82 on page 119) and follow instructions "Launching the
    upgrade" on page 121.

Upgrading from This method is used to make a complete reinstallation of the software
the boot versions.

1   Turn off the SmartOTDR using the **ON/OFF** button, keeping the
    equipment connected to the mains.

2   Insert the USB stick onto which the software versions are stored into
    one of the USB port of the Platform

3   Press simultaneously **SETUP + START/STOP** buttons

4   Maintaining the two buttons pressed, press **ON** button to start the
    SmartOTDR.

5   A menu displays, then the screen allows to select **Upgrade from
    USB**

    After a few seconds, a new page displays indicating that to continue
    the reboot, the validation key must be pressed.

    Press the hard key ⬤ .

The reboot starts automatically.

> ⚠ **The Testing indicator will be lit in red during upgrade. Do not push any key or remove the USB memory stick until the lit turns off.**

Once the upgrade is completed, the SmartOTDR will automatically turns on and display the **Home** page.

Install Software License

This page allows to import the licence to get a software option.

Licence Code

Fig. 85 Example of a License file (.lic)

To import the license, you can either enter manually the licence code, given in the license file, (.lic file) or import this file with a USB memory stick connected to the SmartOTDR.

> ⚠ **It is strongly recommended to perform the installation using the importation of Licence via a USB memory stick.**

Enter Manually the **1** In the **Home** page, click on **Settings** icon .
Licence

2 Press successively the menu keys **Expert Tools** > **Upgrades** > **Install Option** > **Enter Challenge**

The edition keypad is displayed

3 Enter the challenge code of the option, set at the bottom of the file (see Figure 85 on page 123),

Fig. 86 Enter the Licence code

The license file can be opened via a word processing software such as Word...
The challenge code must be entered exactly as it is in the .lic file, paying attention to the lower-case and upper-case letters etc.

4 Press the **Enter** key to validate the code

Your software options will be installed

At the end of this sequence you will be asked to reboot the unit to apply the modifications, pushing the key Reboot . Confirm the reboot to restart the Platform.

Import the license **1** In the **Home** page, select the **Settings** icon .
from the USB
memory stick **2** In the **System Settings** page, press **Expert Tools** > **Upgrades** > **Install Option** > **Import License**

If the USB memory stick is not already connected to the Platform, a message asking the memory stick insertion is displayed. Confirm it once the stick is connected.

3 In the File Explorer, select the USB stick, then the license file (.lic) to be imported,

4 Click on **Load** > **Confirm**

5 The challenge codes contained in this file will then be loaded automatically and your software options will be installed.

Fig. 87 License imported

6 At the end of this sequence you will be asked to reboot the unit to apply the modifications, pushing the key Reboot .

7 Confirm the reboot

Locking the SmartOTDR The SmartOTDR can be locked at any time:

1 In the **HOME** page, select the **Settings** icon Settings .

2 In the **System Settings** page,,click on **Expert Tools**

3 Click on **Instrument Lock Out**

4 Confirm the SmartOTDR locking by clicking on **Confirm** (or use the **Cancel** key to cancel the process).

The numeric keypad is displayed

5 Enter the password to lock the instrument: 42000 with the numeric keypad displayed.

Fig. 88 Password

6 Click on **Enter**

The SmartOTDR locking screen is displayed.

Fig. 89 Locking screen

Click on the **Notepad Message** key to add a message using the text edition.

Unlocking the SmartOTDR

1 Once the locking screen is displayed, click on the key **Unlock Instrument**.

2 Press confirm to confirm the Platform must be unlocked.

3 Enter the password **42000** using the numeric keypad displayed and validate.

The screen automatically displays the **HOME** page.

Returning an instrument When returning an instrument, it is essential to indicate the following minimum information:

– the type and serial number of the instrument (on the identification label) and the configuration code (under the bar code)

– a description of the fault found on the instrument.

The returned instrument will then be repaired and calibrated.

Guarantee conditions Any repair operation supervening within the guarantee period of the instrument will be carried out at the expense of JDSU. However, for any sub-assembly upon which work has been carried out otherwise than by JDSU Service Centers, the cost of a replacement sub-assembly will be invoiced.

Recycling Information

JDSU recommends that customers dispose of their instruments and peripherals in an environmentally sound manner. Potential methods include reuse of parts or whole products and recycling of products components, and/or materials.

Waste Electrical and electronic Equipment (WEEE) Directive

In the European Union, this label indicates that this product should not be disposed of with household waste. Il should be deposited at an appropriate facility to enable recovery and recycling.

Troubleshooting

Interpreting alarms

Troubleshooting	Solution
Nothing happens when the **ON/OFF** key is pressed.	- Make sure that the battery is present or charged; or the mains adapter is properly connected (see "Connecting the mains adapter" on page 13).
Nothing happens on screen, whatever is the action done (menu key or hard key pressed...)	- The Platform must be rebooted. See "Resetting the SmartOTDR" on page 15.
You are using the SmartOTDR in the ordinary way when it suddenly switches off.	- Check the instrument is not configured to Auto off. See "Defining the Automatic shutdown of the Smart-OTDR" on page 22). - Check the battery charge level. See "Charging the battery" on page 13.
The battery refuses to charge (the **Charge** indicator does not go on when the instrument is connected to the mains and is not operating).	- There is no battery in the instrument. - The temperature level of the equipment does not allow the battery charging for safety reasons. Wait the equipment cools down. - The battery needs to be changed. See "Changing the battery" on page 129.

Troubleshooting	Solution
Error message when USB has been disconnected	- The USB disconnection has not been done properly (see "USB memory stick disconnection" on page 98) - The data transfer was not completed when USB key was disconnected.
No beep is emitted when the USB memory stick is connected	- A previous USB memory stick has not been properly disconnected (see "USB memory stick disconnection" on page 98). - The USB memory stick is not detected by the SmartOTDR: use another memory stick, or another storage media; or transfer data via USB cable (see "Transferring files to a PC with the USB cable" on page 93).
Error message when upgrade via Ethernet is confirmed	- Check the Server Name is correctly entered (see "Installation from another server" on page 119)
Error message when upgrade via USB key is confirmed	Check the USB key is correctly connected (see "USB memory stick connection" on page 98)
Error message when unlocking the instrument	- The password is not the correct one (see "Locking the SmartOTDR" on page 125).

Formatting the USB memory stick onto the SmartOTDR

If the USB icon is displayed on the upper banner of the screen, when a USB memory stick is connected to the SmartOTDR, this may means the memory stick must be formatted.

If the stick needs to be formatted, proceed as follows:

1 Insert the memory stick into one of the USB port on the top of the SmartOTDR.

2 Press the **HOME** button

3 Validate the **Settings** icon to open the **System Settings** page.

4 On the right menu keys, successively select **Expert tools** > **Media utilities** > **Usbflash Format.**

5 Confirm your choice to actually format the USB memory stick.

As for any media formatting, please note that all data present on the USB memory stick will be irremediably lost.

Erase disk   To delete all the disk contents of the SmartOTDR:

1   On the Home page, press the **Settings** icon to open the **System Settings** page

2   Press **Expert Tools** > **Media Utilities**,

3   Select **Disk Erase** to delete all the disk contents into the Smart-OTDR.

    A confirmation must be validated before the deletion.

4   Enter the password 02468753 and press **Enter** to start disk erasing.

Changing the battery   If you meet problems during the Platform functioning, or if the battery does not charge anymore when plugged, this may require the battery to be replaced.

> ⚠️ **CAUTION**
> **Battery is not interchangeable in the field. It must be replaced exclusively for maintenance purpose.**

Accessing to the damaged battery   To access the battery of the SmartOTDR, proceed as follows:

1   Switch off the instrument and disconnect the mains supply.

2   Turn the instrument face down on the work surface.

3   Remove the battery door

4   Pull the battery connector from its housing, to disconnect it from the base, taking care not to damage the connector into which it is plugged.

Fig. 90   Battery installation

⚠ **Date and Time parameters will be lost when battery is disconnected.**

Installing a new **1** Set the battery into the Platform

battery **2** Connect the new battery in the connector of the SmartOTDR, <u>in the right way</u> using the location notch.
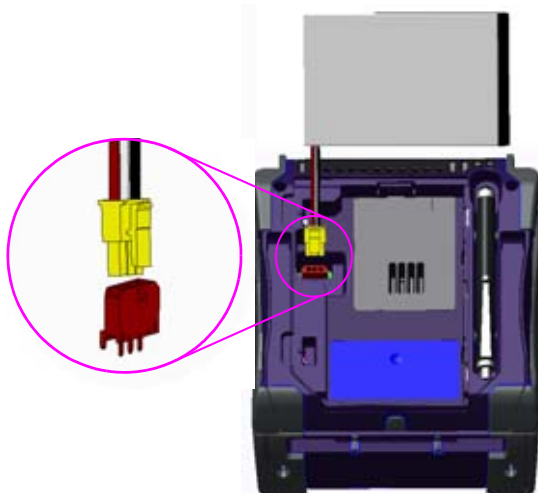

Fig. 91 Setting a new battery

3 Close the battery door

The instrument can be restarted.

NOTE

Take care to set the connector of the battery in the right way on the plug of the base!

Do not forget the black foam to wedge the battery.

⚠ **When putting a battery back into its seating, make sure that its connector engages correctly with the one of the base and that the door is correctly closed.**

Contact JDSU local Sales Service to get a new battery.

Do not use any battery other than the one supplied with the instrument, or supplied by JDSU.

General information on warranty

The warranties described herein shall apply to all commercially available JDSU products. Any additional or different warranties shall apply only if agreed to by JDSU in writing. These warranties are not transferable without the express written consent of JDSU.

Hardware Warranty   JDSU warrants that Hardware Product sold to customer shall, under normal use and service, be free from defects in materials and workmanship. Information regarding the specific warranty period for this product can be obtained by contacting your local JDSU Customer Service Representative, or at our web site ***www.jdsu.com***. If installation services have been ordered, the warranty period shall begin on the earlier of (1) completion of installation, or (2) thirty (30) days after shipment to customer. If Installation Services have not been ordered, the warranty period shall begin upon shipment to Customer. Hereafter these periods of time shall be collectively referred to as the Initial Warranty Period.

JDSU 's obligation and customer's sole remedy under this Hardware Warranty is limited to the repair or replacement, at Acterna's option, of the defective product. JDSU shall have no obligation to remedy any such defect if it can be shown: (a) that the Product was altered, repaired, or reworked by any party other than JDSU without JDSU's written consent; (b) that such defects were the result of customer's improper storage, mishandling, abuse, or misuse of Product; (c) that such defects were the result of customer's use of Product in conjunction with equipment electronically or mechanically incompatible or of an inferior quality; or (d) that the defect was the result of damage by fire, explosion, power failure, or any act of nature.

JDSU performed repairs shall be warranted from defective material and workmanship for a period of ninety (90) days, or until the end of the Initial Warranty Period, whichever is longer. Risk of loss or damage to Product returned to JDSU for repair or replacement shall be borne by customer until delivery to JDSU.

Upon delivery of such product, JDSU shall assume the risk of loss or damage until that time that the product being repaired or replaced is returned and delivered to customer. Customer shall pay all transportation

costs for equipment or software shipped to JDSU for repair or replace-
ment. JDSU shall pay all transportation costs associated with returning
repaired or replaced product to customer.

**Warranty
disclaimer** For hardware and/or services furnished by JDSU, the foregoing warran-
ties are in lieu of all other warrantees and conditions, express or implied.
JDSU specifically disclaims all other warranties, either express or
implied, on any hardware, documentation or services including but not
limited to warranties relating to quality, performance, noninfringement,
merchantability or fitness for a particular purpose, as well as those arising
from any course of dealing, usage or trade practice. under no circum-
stances will JDSU be liable for any indirect or consequential damages
related to breach of this warranty.

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